



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

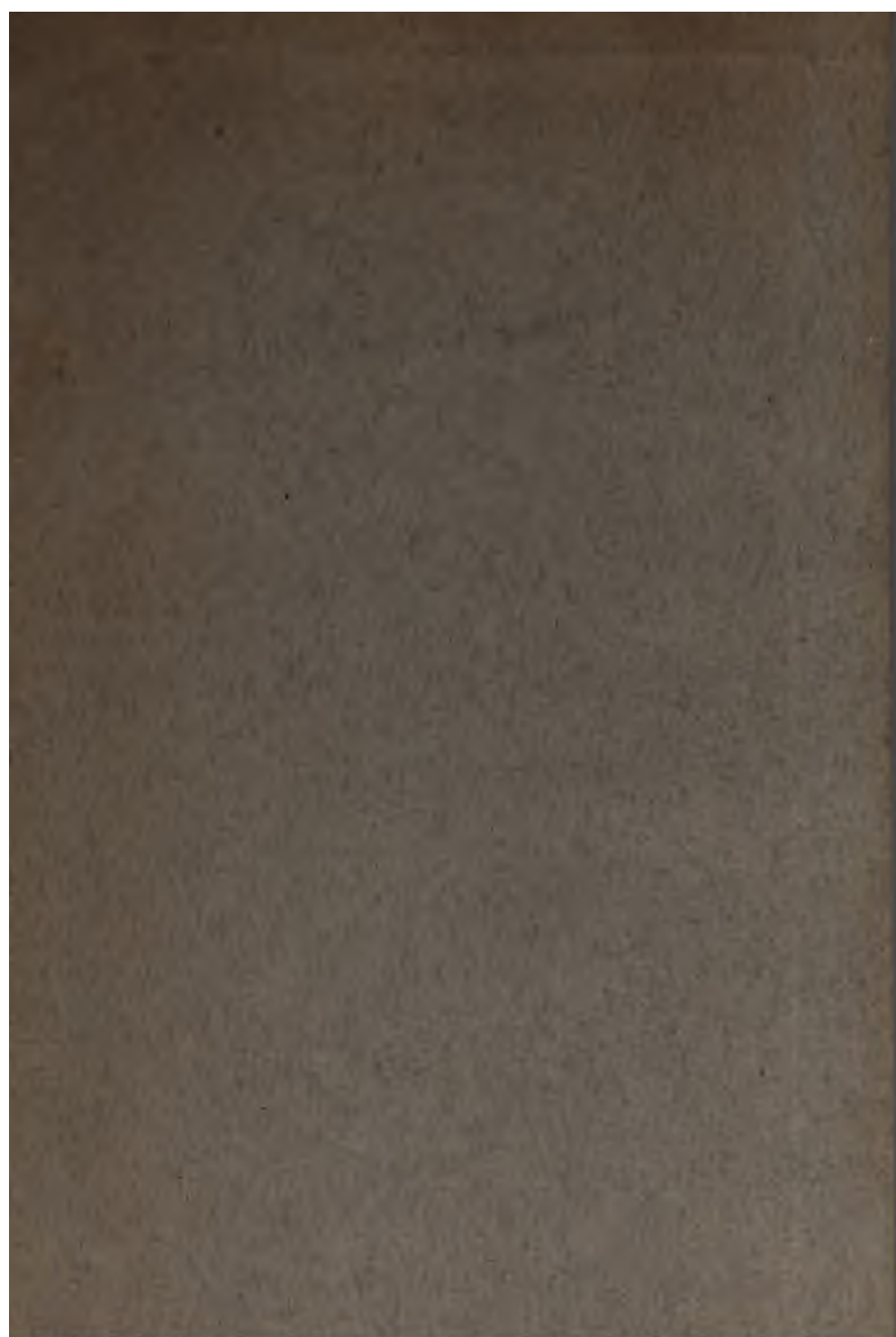
Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

NYPL RESEARCH LIBRARIES



3 3433 06644743 8





Gr. Britain

OK

2

ONS

~~11-11-11~~





THE  
**NAUTICAL ALMANAC**  
AND  
**ASTRONOMICAL EPHEMERIS**  
FOR THE YEAR  
**1850.**

---

PUBLISHED BY ORDER OF  
THE LORDS COMMISSIONERS OF THE ADMIRALTY.

---



**London:**

PRINTED BY WILLIAM CLOWES AND SONS, STAMFORD STREET,  
AND SOLD BY  
**JOHN MURRAY, ALBEMARLE STREET.**  
**1846.**

---

PRICE FIVE SHILLINGS.

WIOY W/34  
CLUB  
YMAA 2811

# CONTENTS,

## ALPHABETICALLY ARRANGED.

\* \* The large Roman Numerals indicate the Page of each Month;  
small, the Page of the Preface; and the Arabic, the Page of the Book.

	Pages
ations and Symbols - - - - -	xiii
r, Principal Articles of the - - - - -	xii
lements of - - - - -	viii
phemeris of - - - - -	375 to 377
———— for Opposition - - - - -	378 to 383
ations of the Satellites of Jupiter - - - - -	XIX
ates of the Sun - - - - -	267 to 274
he Year - - - - -	XXII
of Jupiter's Satellites - - - - -	XX
— the Sun - - - - -	565 to 569
of Time - - - - -	I and II
— the Equinoctial Points - - - - -	266
tial Time - - - - -	XXII
- - - - -	xiv
tion of the Articles, &c. - - - - -	593 to 620
and Anniversaries - - - - -	xii
of the Year - - - - -	XXII
1, Ephemeris of the - - - - -	438 to 457
ements of - - - - -	viii
phemeris of - - - - -	357 to 359
———— for Opposition - - - - -	360 to 365
Ephemeris of - - - - -	384 to 407
Satellites, Configurations of - - - - -	XIX
———— Eclipses of - - - - -	XX
———— Occultations, &c., of - - - - -	XXI
ms and Returns - - - - -	xiii
stances - - - - -	XIII to XVIII
———— Correction for Second Differences of - - - - -	580
phemeris of - - - - -	324 to 347
ases of - - - - -	575
me of Transit of the first point of Aries - - - - -	XXII
Ephemeris of - - - - -	276 to 299
anets, Elements of - - - - -	viii



Moon-Culminating Stars - - - - -	504
Moon, Ephemeris of the - - - - -	III
—— Meridian Ephemeris of the - - - - -	504
—— Phases of the - - - - -	-
—— Apogee and Perigee of the - - - - -	-
—— Libration of the - - - - -	-
—— Mean Longitude of Node of the Orbit of the - - - - -	-
Obliquity of the Ecliptic - - - - -	-
Observatories, Latitude and Longitude of the Principal - - - - -	588
Occultations of Stars by the Moon, visible at Greenwich - - - - -	547
—— Elements for computing - - - - -	551
—— of Jupiter's Satellites by Jupiter - - - - -	-
Pallas, Elements of - - - - -	-
—— Ephemeris of - - - - -	366
—— for Opposition - - - - -	369
Phenomena - - - - -	565
Pole Star, Tables to find the Latitude by the - - - - -	581
Stars, Mean Places of - - - - -	456
—— Apparent Places of - - - - -	462
—— Constants, for Reduction of - - - - -	460
—— Logarithms of A, B, C, D, for Reduction of - - - - -	-
—— Formulæ, for Reduction of - - - - -	-
—— Correction of, for 2 $\epsilon$ - - - - -	502
Saturn, Ephemeris of - - - - -	408
—— Ring of - - - - -	-
Sidereal Time at Mean Noon - - - - -	-
Sun, Ephemeris of the - - - - -	I
—— Eclipses of the - - - - -	565
—— Aberration of the - - - - -	-
—— Parallax of the - - - - -	-
—— Co-ordinates of the - - - - -	267
Terms, Law, and University - - - - -	-
Tides - - - - -	576
Time Equivalents, Tables of - - - - -	584
Transits of Jupiter's Satellites and their Shadows - - - - -	-
University Terms - - - - -	-
Venus, Ephemeris of - - - - -	300
—— Phases of - - - - -	-
Vesta, Elements of - - - - -	-
—— Ephemeris of - - - - -	348
—— for Opposition - - - - -	351

## P R E F A C E.

ments of the NAUTICAL ALMANAC and ASTRONOMICAL EPHEMERIS for the  
are the same generally as those of the preceding year.

Longitude from the *Mean* Equinox, the Latitude, and the Earth's Radius  
been deduced from the New Tables appended to *Effemeridi Astronomiche*  
per l'Anno 1833, (Milano, 1832), using a difference of Meridians =  $36^m 45^s$ .

Perturbations of Longitude and Radius Vector produced by each of the Planets,  
Mars, Jupiter, and Saturn, have been computed accurately from the Tables for  
each day of the year; the Sums then interpolated with second differences for  
each day, and thence the daily perturbations by simple proportion. The other  
calculations have been performed independently for every Mean Noon.

Latitude of the Sun, depending on the attraction of the Moon, was computed  
each day, and that part depending upon the Planets, Venus and Jupiter, was  
for each tenth day and interpolated.

Calculations of the Obliquity of the Ecliptic ( $\Delta \omega$ ) and of Longitude ( $\Delta L$ ), have  
been derived from MS. Tables, constructed by the late Mr. JAMES EFPS, according  
to the following formulæ:

$$9'' \cdot 2500 \cos 2 \Omega - 0'' \cdot 0903 \cos 2 \Omega + 0'' \cdot 0900 \cos 2 \mathfrak{D} + 0'' \cdot 5447 \cos 2 \odot \\ - 17'' \cdot 2985 \sin 2 \Omega + 0'' \cdot 2082 \sin 2 \Omega - 0'' \cdot 2074 \sin 2 \mathfrak{D} - 1'' \cdot 2550 \sin 2 \odot$$

where  $\Omega$  is the Mean Longitude of the Moon's ascending Node,  $\mathfrak{D}$  the true Longitude of the  
Moon, and  $\odot$  the true Longitude of the Sun, (*Ast. Soc. Cat.*, pages xiv and xv);  
terms depending on  $2 \mathfrak{D}$  have been omitted.

Mean Obliquity of the Ecliptic has been taken =  $23^\circ 27' 31'' \cdot 95$ , on January 1,  
and the Mean Annual diminution =  $0'' \cdot 457$ . (*BESSEL's Tab. Reg.* page 9.)  
The Sun's Right Ascension and Declination were computed independently for  
each Mean Noon.

Semidiameter of the Sun, at the Earth's Mean Distance, has been taken  
as determined by the late Professor BESSEL from 1698 transits, in which  
transits had been observed at Königsberg, between the Years 1820 and 1828, with  
BACH's meridian circle. (*BESSEL's Tab. Reg.* page L.)

Equatorial Horizontal Parallax of the Sun, at the Earth's Mean Distance, has  
been taken =  $8'' \cdot 5776$ , as deduced by Professor ENCKE, from the Transits of Venus,  
in 1761 and 1769. (*Der Venusdurchgang von 1769, &c.* Gotha, 1824. page 108.)  
Constant of Aberration =  $20'' \cdot 42$ . (Preface to *B. A. Cat.*, page 21.)

Sidereal Time at Mean Noon =  $\frac{\text{Sun's Mean Longitude} + \text{Nutation}}{15}$

According to BESSEL (*Tab. Reg.* page XXIV), the Mean Longitude of the Sun,  
Mean Noon of January 0<sup>d</sup> of the year 1800 +  $t$ , is

$$9^\circ 54' 1'' \cdot 36 + t \cdot 27'' \cdot 605844 + t^2 \cdot 0'' \cdot 0001221805 - f \cdot 14' 47'' \cdot 083$$

where  $t$  denotes, for the 19th century, the number of years from the year immediately

preceding  $1800 + t$ , which is divisible by 4 without a remainder. Assuming Meridian of Greenwich to be  $9^m 21^s.5$  West of that of Paris, and altering the epoch to the Mean Noon of January 1 of the year  $1800 + t$ , the Sun's Mean Longitude (M) for the meridian of Greenwich is hence found equal to

$$280^\circ 53' 32''.75 + t.27''\cdot605844 + t^2.0''\cdot0001221805 - f.14' 47''.083,$$

and we have, for the Mean Noon of any day ( $n$ ) of the year  $1800 + t$ ,

$$\text{Sidereal Time} = \frac{M}{15} + n.3^m 56^s\cdot555348 + \text{Nutation in R. A.}$$

The Sun's Geocentric Co-ordinates have been computed from the following formulæ:

$$X = r \cos \odot$$

$$Y = r \sin \odot \cos \omega$$

$$Z = r \sin \odot \sin \omega = Y \tan \omega$$

in which  $r$  represents the Radius Vector of the Earth,  $\odot$ , the Sun's true Longitude from the true Equinox, and  $\omega$  the apparent obliquity of the Ecliptic.

The Longitude of the Moon from the Mean Equinox, the Latitude, Horizon Parallax and Semidiameter have been derived from BURCKHARDT'S *Tables de la Lune* (Paris, 1812), using a difference of Meridians =  $9^m 21^s$ : The arguments have been taken from the Tables for each fifth Noon, and interpolated for every Noon and Midnight by the continued addition of one-tenth of the difference, retaining throughout an additional figure: with the arguments so formed the places have been computed independently for every Mean Noon and Midnight of the Year, the second differences have been taken into account wherever the irregular variation of the Equations rendered such a correction appreciable. The Longitude has then been reduced to the True Equinox, and the results differenced to the fourth order, and carefully examined. Wherever the progression of the fourth differences indicated a probable error of more than  $0''.5$  the computations have been re-examined.

The Right Ascension and Declination have been computed for each noon and midnight, examined by means of differences to the fourth order, and interpolated for every hour. From these have been deduced the Right Ascension and Declination at Transit, on each day of the year.

The Lunar Distances from the Sun have been computed from Longitudes and Latitudes for each Noon and Midnight, examined by means of differences to the fourth order, and interpolated for every three hours. Those from the Planets and Stars have been computed from Right Ascensions and Declinations for every six hours, examined by means of differences to the second, third, and sometimes fourth order, according to the irregularity of their variation, and interpolated for every three hours.

The Places of Mercury, Venus, and Mars, from the Mean Equinox, have been derived from LINDENAU'S *Tables\**, assuming Greenwich to be  $42^m 56^s$  West

\* Investigatio nova Orbitæ a Mercurio circa Solem descriptæ, accedunt Tabulæ Planetarum Elementis recens repertis et Theoria Gravitatis Illust. De Laplace constructæ. Auctore BERNHARDO DE LINDENAU. Gothæ, 1813. 4to.

Tabulæ Veneris novæ et correctæ ex Theoria Gravitatis clarissimi De Laplace et ex Observationibus recentissimis in specula Astronomica Seebergensi habitis erutæ. Auctore BERNHARDO DE LINDENAU. Gothæ, 1810. 4to.

Tabulæ Martis novæ et correctæ ex Theoria Gravitatis clarissimi De Laplace et ex Observationibus recentissimis erutæ, Auctore BERNHARDO DE LINDENAU. Eisenberg, 1811. 4to.



and those of Jupiter, Saturn, and the Georgian, from BOUVARD's new with a difference of meridians =  $9^{\text{m}} 21^{\text{s}}.5$ .

Mercury, the Perturbations were obtained immediately from the Tables for Late Mean Noon and interpolated with first differences: the remainder of the calculations were performed independently for every Mean Noon.

Thus, the Heliocentric Longitude from the *True Equinox*, Latitude and Radius Vector, were computed independently for Mean Noon of every eighth day, and interpolated with fourth differences for each day. The Geocentric places were computed for every fourth day, and the intermediate values obtained by interpolating with fourth differences.

Thus, the Heliocentric Longitude from the *True Equinox*, Latitude and Radius Vector, were obtained independently for Mean Noon of every twelfth day, and interpolated with fourth differences for each day. The Geocentric places were computed for every sixth day, and interpolated with fourth differences.

Thus, for Jupiter, Saturn, and the Georgian, the Heliocentric Longitude from the *True Equinox*, Latitude and Radius Vector, were computed for Mean Noon at intervals of ten days; and interpolated, for each day, with second differences. The Geocentric places were obtained independently for every sixth day, and interpolated with fourth differences, using differences to the fourth order.

Minor Planets, with the Elements of the Orbits of Vesta and Juno given at page viii of the NAUTICAL ALMANAC for 1848, and of Pallas and Ceres, at page viii of the NAUTICAL ALMANAC for 1849, the Heliocentric Longitudes have been first computed for Mean Noon, and the periods of the next Oppositions ascertained approximately. Thus, Pallas, and Ceres are all in Opposition in the Year 1850. For each of these Planets the Variations of the Elements, caused by Venus, the Earth, Mars, Jupiter, and Saturn, have been computed for intervals of twelve days, for the whole year between the Oppositions, agreeably to the method described in Professor LAPLACE's, "*On the Calculation of the Perturbations of the Small Planets of short period.*"—(APPENDIX to NAUTICAL ALMANAC, 1837,

Perturbations, the following masses of the disturbing Planets have been

$\frac{1}{401211}$	(AIRY, <i>On the corrections in the Elements of Delambre's Solar Tables</i> , &c.— <i>Phil. Trans.</i> , 1828, page 30).
$\frac{1}{354936}$	( <i>Système du Monde</i> , 5th Edition, page 209).
$\frac{1}{2680337}$	(BURCKHARDT, <i>Conn. des Temps</i> , 1831, page 153).
$\frac{1}{104870}$	(AIRY, <i>Mem. Ast. Soc.</i> , vol. vi. page 97).
$\frac{1}{3512}$	( <i>Système du Monde</i> , 5th Edition, page 209).

---

astronomiques publiées par le Bureau des Longitudes de France, contenant les Tables de la Lune et d'Uranus, construites d'après la Théorie de la Mécanique Céleste: par M. A. DELAMBRE, 1821. 4to.

The following are the resulting Elements:—

## I. VESTA.

Epoch, 1850, January 11<sup>h</sup> 0<sup>m</sup> Mean time at Greenwich.

Mean Longitude of $\Upsilon$	- - - $\epsilon$	- - - 117° 4' 3" 2	} From Mean of Jan. 1
Longitude of the Perihelion	- $\varpi$	- - - 250 46 4 0	
Longitude of Ascending Node	- $\nu$	- - - 103 22 33 8	
Inclination of the Orbit	- - - $i$	- - - 7 8 28 3	
Angle of Excentricity	- - - $\phi$	- - - 5 8 23 1	
Mean daily Sidereal motion	- $n$	- - - 978" 00114	

8 1850, January 9, 21<sup>h</sup> 50<sup>m</sup> 6 Mean Time at Greenwich.

## II. JUNO.

Epoch, 1850, April 5<sup>h</sup> 0<sup>m</sup> Mean Time at Greenwich.

Mean Longitude of $\ddagger$	- - - $\epsilon$	- - - 178° 17' 36" 0	} From Mean of April 5
Longitude of the Perihelion	- $\varpi$	- - - 54 23 42 4	
Longitude of Ascending Node	- $\nu$	- - - 170 54 4 1	
Inclination of the Orbit	- - - $i$	- - - 13 3 28 4	
Angle of Excentricity	- - - $\phi$	- - - 14 45 52 2	
Mean daily Sidereal Motion	- $n$	- - - 812" 90852	

8 1850, April 8, 0<sup>h</sup> 7<sup>m</sup> 2 Mean Time at Greenwich.

## III. PALLAS.

Epoch, 1850, August 27<sup>h</sup> 0<sup>m</sup> Mean Time at Greenwich.

Mean Longitude of $\dagger$	- - - $\epsilon$	- - - 339° 45' 8" 3	} From Mean of Aug. 1
Longitude of the Perihelion	- $\varpi$	- - - 121 21 25 8	
Longitude of Ascending Node	- $\nu$	- - - 172 43 52 3	
Inclination of the Orbit	- - - $i$	- - - 34 37 39 1	
Angle of Excentricity	- - - $\phi$	- - - 13 52 21 2	
Mean daily Sidereal Motion	- $n$	- - - 768" 44857	

8 1850, August 22, 19<sup>h</sup> 11<sup>m</sup> 3 Mean Time at Greenwich.

## IV. CERES.

Epoch, 1850, October 2<sup>h</sup> 0<sup>m</sup> Mean Time at Greenwich.

Mean Longitude of $\S$	- - - $\epsilon$	- - - 8° 25' 16" 6	} From Mean of Oct. 1
Longitude of the Perihelion	- $\varpi$	- - - 147 46 1 3	
Longitude of Ascending Node	- $\nu$	- - - 80 49 39 4	
Inclination of the Orbit	- - - $i$	- - - 10 37 3 7	
Angle of Excentricity	- - - $\phi$	- - - 4 23 40 2	
Mean daily Sidereal Motion	- $n$	- - - 770" 43589	

8 1850, September 24, 21<sup>h</sup> 5<sup>m</sup> 4 Mean Time at Greenwich.

With these Elements, and their Variations for intervals of twelve days and following their respective Epochs, the Places of these Planets at and about the times of their Oppositions were obtained.

The Opposition of Vesta occurring so early in the year 1850, it was deemed to publish the Ephemeris in the NAUTICAL ALMANAC for 1849, from which it has been reprinted in the present volume.

The Ephemeris of each of the Planets, Mercury, Venus, Mars, Jupiter, and the Georgian, at the Time of Transit, has been computed for each Year from their Places at Mean Noon. That of each of the Minor Planets, from their respective Oppositions, from the accurate Noon Ephemeris.

Semidiameters of the Planets, at the Mean Distance of the Earth from the have been adopted as follow :

Mercury,	Eq. Sem.	3° 23'	(Lindenau's <i>Tables of Mercury</i> , page 38)
Venus,	Eq. Sem.	8° 25'	(Delambre's <i>Astronomy</i> , vol. ii. page 620)
Mars,	Eq. Sem.	4° 435'	(Littrow's <i>Astronomy</i> , vol. ii. page 389)
Jupiter,	Eq. Sem.	99° 704'	( <i>Mem. Ast. Soc.</i> , vol. iii. page 301)
Saturn,	Eq. Sem.	81° 106'	( <i>Ast. Nach.</i> No. 189)
Georgian,	Eq. Sem.	37° 25'	(Delambre's <i>Astronomy</i> , vol. ii. page 620)

Eclipses of Jupiter's Satellites have been computed, in duplicate, from "*Tables numériques des Satellites de Jupiter, d'après la théorie de leurs attractions mutuelles constantes déduites des Observations.* Par le Baron DAMOISEAU. Publiées par le Baron DAMOISEAU. Paris, 1836," using  $9^m 21^s.5$  for the difference of meri-

as formerly the practice to direct the attention of observers to those Eclipses only happened when Jupiter was not less than  $8^\circ$  above the Horizon and the Sun below. It appearing, however, by a paper read before the Royal Astronomical Society April 13, 1838, (*Ast. Soc. Notices*, vol. iv. p. 131,) that Mr. RIDDLE observed the Eclipses of the First and Second Satellites at Greenwich on April 9, 1838, without Doubt, when the Sun was much less than  $8^\circ$  below the Horizon, a new limit was fixed in the year 1842, and while the asterisk has been retained to indicate the Eclipses agreeably to the old limits, a dagger is used to indicate that Jupiter is *above* the Horizon and the Sun *below*.

the Configurations and Occultations of the Satellites, as well as the Transits of the Satellites and their Shadows over the disc of the Planet, Mr. WOOLHOUSE's Tables in the APPENDIX to the NAUTICAL ALMANAC for 1835 have been used, with the Addition of Table II. of each Satellite, which has been reconstructed to adapt it to DAMOISEAU's New Tables.

Elements at page 574, for determining the appearance of Saturn's Ring, have been calculated by means of the formulæ\* at page viii of the NAUTICAL ALMANAC for 1836, adopting the late Professor BESSEL's determinations of the values of  $\Omega$ ,  $i$ ,  $a'$ , viz. :—

$$\left. \begin{aligned} \Omega &= 166^\circ 53' 8''.9 + 46''.462 (t - 1800) \\ i &= 28 10 44.7 - 0.350 (t - 1800) \\ a' &= 39''.308 \end{aligned} \right\} \text{Ast. Nach., No. 274, col. 167.}$$

$a' = 39''.308$  (*Ast. Nach.*, No. 275, col. 170).

Mean distance of the Planet from the Sun being taken =  $9.54301$ , agreeably to DAMOISEAU's Tables of Saturn, instead of  $9.5421889$ , the value used by BESSEL in the Eclipses of his observations.

Mean Places of the 100 Principal Fixed Stars for Jan. 1, 1850, together with the Annual Variations, have been derived from the fundamental Catalogue for 1800, contained in the NAUTICAL ALMANAC for 1848, pages 436 to 441, by means of the Formulæ at page xiv of the PREFACE to the *Second Edition* of the NAUTICAL ALMANAC for 1834.

Logarithms of A, B, C, D, at page XXII. of each Month, have been com-

\* See Errata in the NAUTICAL ALMANAC for 1840, page xv.



puted agreeably to the Formulæ at page 459, omitting only in the Values of  $C$  the terms  $-0.004 \sin 2\zeta$  and  $-0''.090 \cos 2\zeta$ ; and for the only Stars that sensibly affected by the omission, viz. the five Polar Stars, a Table of Corrections given at pages 502 and 503.

The Table of Constants at pages 460 and 461 for facilitating the Reduction of Stars generally, has been computed from BESSEL's Formulæ, given at page 459 for the  $A, B, C, D$ , contained in this volume.

The apparent places of 95 of the principal Stars have been deduced from the Places for January 1, 1850, using the Variables  $A, B, C, D$  in the present Volume, and the constants in the Catalogue of the British Association.\* For the five Polar Stars the constants have been computed for 1850 and 1851, and interpolated. The corrections were computed independently for every tenth day, with the exception of for  $\alpha$  and  $\delta$  URSA MINORIS, which were interpolated, with second difference computations made for every third day of the year.

A further correction of the right ascension for *daily* aberration is necessary, extreme accuracy is required, and may be computed as follows: Let  $\phi$  denote the latitude of the place, and  $\delta$  the declination of the Star, then the correction (in seconds) for the *upper* transit is,

$$+ 0''.0206 \cos \phi \sec \delta$$

and for the *lower* transit,

$$- 0''.0206 \cos \phi \sec \delta$$

The Lists of Moon-Culminating Stars and Occultations have been selected from BAILY's Catalogue of Zodiacal Stars. (London, 1827.)

The Mean Places of the Stars for both Lists were taken in order of preference, 1. From the Catalogue of the 100 Stars in this Work. 2. From AIRY's Great Catalogue of 1439† Stars. 3. From the Catalogue of the British Association. The reduction of the Mean to the Apparent Places has been performed by means of the Constants in the Catalogue of the British Association; the corrections for each star for the contiguous days being obtained by different computers for the Moon-Culminating List, and those for the Occultations by duplicate computations.

The calculations of the Elements of Occultations, the Occultations visible from Greenwich, and the Solar Eclipses, have been made in the manner described by WOOLHOUSE in the Appendix to the NAUTICAL ALMANAC for 1836; those relating to the Occultations in duplicate.

The Tides at London Bridge for the year 1850 have been computed from the tables in "An Elementary Treatise on the Tides. By J. W. LUBBOCK, Esq." (London, 1845.)

\* The Catalogue of Stars of the British Association for the Advancement of Science; containing Mean Right Ascension and North Polar Distances of eight thousand three hundred and seventy Fixed Stars, reduced to January 1, 1850: together with their annual precessions, secular variations of proper motions, as well as the logarithmic constants for computing precession aberration, and nutation. With a Preface explanatory of their Construction and Application. By the late Francis Baily. London, 1845. 4to.

† Catalogue of the Places of 1439 Stars, referred to the 1st January, 1840; deduced from the observations made at the Royal Observatory, Greenwich, from 1836, January 1, to 1841, December 31. London, 1843. 4to.

Tables for finding the Latitude of a place by Observations of the Pole Star (*α MINORIS*), at any hour of the day, are founded on the following formula:

$$l = a - p \cos h + \frac{1}{2} \sin 1'' (p \sin h)^2 \tan a$$

$l$  denotes the latitude

$a$  — the true altitude of the Star

$p$  — the apparent polar distance, expressed in seconds of arc

$h$  — the hour angle of the Star  $= S - \alpha$ ;  $S$  being the sidereal time of a-  
tion, and  $\alpha$  the right ascension of the Star.

Table I contains the value of the *second* term ( $p \cos h$ ) or the *first* correction; giving, as *mean* values,  $p = 88' 50''$ , and  $a = 16^\circ 25'$ .

Table II contains the value of the *third* term ( $\frac{1}{2} \sin 1'' (p \sin h)^2 \tan a$ ) or the *correction*, using the same *mean* quantities as in Table I.

Table III, which is *special* for the year 1850, and depends upon the difference between the true and assumed values of  $p$  and  $a$ , contains the *third* correction added by  $1'$  for the purpose of rendering the quantities additive.

The fourth term ( $-\frac{1}{2} \sin^2 1'' (p \cos h) (p \sin h)^2$ ) is omitted, its greatest value being less than half a second.

In the construction of this Ephemeris generally, duplicate computations have been made where necessary, and independent calculations performed to guard against error in principle, and all results admitting of such test finally examined by means of differences.

W. S. STRATFORD,  
Superintendent of the Nautical Almanac.

*Almanac Office,*  
*Jerusalem Buildings, Gray's Inn, London.*  
August 1, 1846.



## PRINCIPAL ARTICLES OF THE CALENDAR, For the Year 1850.

Golden Number	- - -	8	Dominical Letter	- - -	F
Epact	- - -	17	Roman Indiction	- - -	8
Solar Cycle	- - -	11	Julian Period	- - -	-6563

## FIXED AND MOVEABLE FESTIVALS, ANNIVERSARIES, &c., &c.

Epiphany	- - -	Jan. 6	Pentecost—Whit Sunday	- - -	M
Septuagesima Sunday	- - -	27	Birth of Q. Victoria	- - -	-
Martyrdom of K. Charles I.	- - -	30	Trinity Sunday	- - -	-
Quinquagesima—Shrove Sunday	Feb. 10		Restoration of K. Charles II.	- - -	-
Ash Wednesday	- - -	13	Corpus Christi	- - -	-
Quadragesima—1st Sun. in Lent	- 17		Accession of Q. Victoria	- - -	Ju
St. David	- - -	Mar. 1	Proclamation	- - -	-
St. Patrick	- - -	17	St. John Bapt.—Midsum. Day	- - -	-
Palm Sunday	- - -	24	Birth of Dowager Q. Adelaide	Aug. 1	
Annunciation—Lady Day	- - -	25	St. Michael—Michaelmas Day	Sept. 29	
Good Friday	- - -	29	Gunpowder Plot	- - -	N
EASTER SUNDAY	- - -	31	Birth of Prince of Wales	- - -	-
Low Sunday	- - -	April 7	St. Andrew	- - -	-
St. George	- - -	23	1st Sunday in Advent	- - -	D
Rogation Sunday	- - -	May 5	St. Thomas	- - -	-
Ascension Day—Holy Thursday	- - -	9	Christmas Day	- - -	-

The Year 5611 of the Jewish Era commences on September 7, 1850.

Ramadan (Month of Abstinence observed by the Turks) commences on July 11, 1850.

The Year 1267 of the Mohammedan Era commences on Nov. 6, 1850.

## EXPLANATION OF ASTRONOMICAL SYMBOLS AND ABBREVIATIONS.

The Sun.	♂ Conjunction.	0. ♉ Aries. - - 0
The Moon.	☐ Quadrature.	I. ♈ Taurus. - 30
Mercury.	♂ Opposition.	II. ♊ Gemini. - 60
Venus.	♋ Ascending Node.	III. ♋ Cancer. - 90
The Earth.	♌ Descending Node.	IV. ♌ Leo. - - 120
Mars.	N. North. S. South.	V. ♍ Virgo. - - 150
Vesta.	E. East. W. West.	VI. ♎ Libra. - - 180
Juno.	° Degrees.	VII. ♏ Scorpio. - 210
Pallas.	' Minutes of Arc.	VIII. ♐ Sagittarius. 240
Ceres.	" Seconds of Arc.	IX. ♑ Capricornus. 270
Jupiter.	<sup>h</sup> Hours.	X. ♒ Aquarius. - 300
Saturn.	<sup>m</sup> Minutes of Time.	XI. ♓ Pisces. - - 330
The Georgian.	<sup>s</sup> Seconds of Time.	

## LAW TERMS, 1850,

As settled by Statutes

GEO. IV. and 1 WILL. IV. cap. 70, s. 6. (Passed July 23, 1830.)

WILL. IV. - - - - - cap. 3, s. 2. (Passed Dec. 23, 1830.)

HILARY TERM	- - - -	Begins Jan. 11	Ends Jan. 31
EASTER	- - - - -	Apr. 15	- - May 8
TRINITY	- - - - -	May 22	- - June 12
MICHAELMAS	- - - - -	Nov. 2	- - Nov. 25

or Returns see Statute 1 WILL. IV. cap. 3, s. 2. (Passed Dec. 23, 1830.)

## UNIVERSITY TERMS, 1850.

Terms.	OXFORD.		CAMBRIDGE.		
	<i>Begins.</i>	<i>Ends.</i>	<i>Begins.</i>	<i>Divides.</i>	<i>Ends.</i>
t - - -	Jan. 14	Mar. 24	Jan. 13	Feb. 16, Noon.	Mar. 22
ter - -	April 10	May 18	April 10	May 23, Noon.	July 5
nity - -	May 22	July 6	- - -	- - - - -	- - -
haelmas -	Oct. 10	Dec. 17	Oct. 10	Nov. 12, Midnight.	Dec. 16
<i>The Act, July 2.</i>			<i>The Commencement, July 2.</i>		



**E P H E M E R I S**  
**FOR THE YEAR**  
**1850,**  
**FOR THE MERIDIAN**  
**OF THE**  
**NAUTICAL OBSERVATORY AT GREENWICH.**



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiameter passing the Meridian.*	Equation of Time, to be added to Apparent Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>
Tues.	1	18 46 59.17	11.032	S. 23 1 1.1	12.97	1 11.01	3 51.17
Wed.	2	18 51 23.95	11.018	22 55 49.8	14.11	1 10.96	4 19.32
Thur.	3	18 55 48.39	11.003	22 50 11.1	15.25	1 10.91	4 47.12
Frid.	4	19 0 12.45	10.986	22 44 5.2	16.38	1 10.86	5 14.55
Sat.	5	19 4 36.11	10.968	22 37 32.2	17.50	1 10.80	5 41.58
Sun.	6	19 8 59.35	10.950	22 30 32.3	18.60	1 10.74	6 8.19
Mon.	7	19 13 22.14	10.930	22 23 5.8	19.71	1 10.67	6 34.35
Tues.	8	19 17 44.45	10.908	22 15 12.8	20.80	1 10.60	7 0.03
Wed.	9	19 22 6.25	10.886	22 6 53.6	21.88	1 10.53	7 25.20
Thur.	10	19 26 27.51	10.863	21 58 8.4	22.95	1 10.45	7 49.84
Frid.	11	19 30 48.21	10.838	21 48 57.5	24.02	1 10.37	8 13.91
Sat.	12	19 35 8.31	10.812	21 39 21.1	25.07	1 10.29	8 37.40
Sun.	13	19 39 27.80	10.785	21 29 19.5	26.10	1 10.20	9 0.27
Mon.	14	19 42 46.64	10.757	21 18 53.1	27.12	1 10.11	9 22.49
Tues.	15	19 48 4.81	10.729	21 8 2.2	28.13	1 10.02	9 44.05
Wed.	16	19 52 22.30	10.699	20 56 47.0	29.13	1 9.93	10 4.92
Thur.	17	19 56 39.08	10.668	20 45 7.9	30.11	1 9.83	10 25.09
Frid.	18	20 0 55.12	10.637	20 33 5.2	31.09	1 9.73	10 44.52
Sat.	19	20 5 10.41	10.605	20 20 39.1	32.04	1 9.63	11 3.21
Sun.	20	20 9 24.94	10.573	20 7 50.1	32.98	1 9.53	11 21.13
Mon.	21	20 13 38.69	10.540	19 54 38.6	33.90	1 9.42	11 38.28
Tues.	22	20 17 51.66	10.507	19 41 4.9	34.81	1 9.32	11 54.64
Wed.	23	20 22 3.83	10.473	19 27 9.4	35.71	1 9.21	12 10.21
Thur.	24	20 26 15.18	10.439	19 12 52.4	36.59	1 9.10	12 24.97
Frid.	25	20 30 25.72	10.405	18 58 14.2	37.45	1 8.99	12 38.92
Sat.	26	20 34 35.44	10.371	18 43 15.3	38.30	1 8.88	12 52.05
Sun.	27	20 38 44.35	10.337	18 27 56.1	39.14	1 8.77	13 4.37
Mon.	28	20 42 52.44	10.303	18 12 16.8	39.95	1 8.66	13 15.87
Tues.	29	20 46 59.71	10.269	17 56 18.0	40.76	1 8.54	13 26.56
Wed.	30	20 51 6.16	10.235	17 39 59.9	41.54	1 8.43	13 36.43
Thur.	31	20 55 11.81	10.201	17 23 23.0	42.30	1 8.31	13 45.49
Frid.	32	20 59 16.64		S. 17 6 27.7		1 8.20	13 53.74

\* Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup> 19 from the Sidereal

## AT MEAN NOON.

	Day of the Month.	THE SUN'S			Equation of Time, to be subtracted from Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<i>h m s</i>	<i>° ' "</i>	<i>' "</i>	<i>m s</i>	<i>h m s</i>
s.	1	18 46 58.47	S. 23 1 2.0	16 17.3	3 51.09	18 43 7.37
d.	2	18 51 23.16	22 55 50.9	16 17.3	4 19.23	18 47 3.93
r.	3	18 55 47.51	22 50 12.4	16 17.3	4 47.03	18 51 0.49
d.	4	19 0 11.49	22 44 6.6	16 17.3	5 14.45	18 54 57.04
	5	19 4 35.07	22 37 33.8	16 17.2	5 41.47	18 58 53.60
	6	19 8 58.23	22 30 34.2	16 17.2	6 8.07	19 2 50.16
n.	7	19 13 20.94	22 23 7.9	16 17.2	6 34.23	19 6 46.72
s.	8	19 17 43.18	22 15 15.2	16 17.1	6 59.91	19 10 43.27
d.	9	19 22 4.91	22 6 56.3	16 17.1	7 25.08	19 14 39.83
r.	10	19 26 26.10	21 58 11.4	16 17.0	7 49.71	19 18 36.38
d.	11	19 30 46.72	21 49 0.7	16 17.0	8 13.78	19 22 32.94
	12	19 35 6.76	21 39 24.7	16 16.9	8 37.26	19 26 29.50
	13	19 39 26.18	21 29 23.5	16 16.8	9 0.13	19 30 26.05
n.	14	19 43 44.96	21 18 57.4	16 16.8	9 22.35	19 34 22.61
s.	15	19 48 3.08	21 8 6.8	16 16.7	9 43.91	19 38 19.17
d.	16	19 52 20.51	20 56 51.9	16 16.6	10 4.78	19 42 15.72
r.	17	19 56 37.23	20 45 13.1	16 16.6	10 24.95	19 46 12.28
d.	18	20 0 53.22	20 33 10.7	16 16.5	10 44.38	19 50 8.84
	19	20 5 8.46	20 20 45.0	16 16.4	11 3.07	19 54 5.39
	20	20 9 22.94	20 7 56.4	16 16.3	11 21.00	19 58 1.95
n.	21	20 13 36.65	19 54 45.2	16 16.2	11 38.15	20 1 58.50
s.	22	20 17 49.58	19 41 11.8	16 16.1	11 54.52	20 5 55.06
d.	23	20 22 1.70	19 27 16.6	16 16.0	12 10.09	20 9 51.62
r.	24	20 26 13.02	19 12 59.9	16 15.9	12 24.85	20 13 48.17
d.	25	20 30 23.53	18 58 22.1	16 15.8	12 38.80	20 17 44.73
	26	20 34 33.22	18 43 23.5	16 15.7	12 51.94	20 21 41.28
	27	20 38 42.10	18 28 4.6	16 15.5	13 4.27	20 25 37.84
n.	28	20 42 50.16	18 12 25.7	16 15.4	13 15.77	20 29 34.39
s.	29	20 46 57.41	17 56 27.1	16 15.3	13 26.46	20 33 30.95
d.	30	20 51 3.84	17 40 9.3	16 15.1	13 36.34	20 37 27.50
r.	31	20 55 9.47	17 23 32.7	16 15.0	13 45.41	20 41 24.06
d.	32	20 59 14.28	S. 17 6 37.7	16 14.8	13 53.67	20 45 20.61

\* The Semidiameter for Apparent Noon may be assumed the same as that for Mean Noon.



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Pa	
	Noon.	Noon.		Noon.	Midnight.	Noon.	M
	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	
1	280 47 49.0	S. 0.02	9.9926575	16 24.2	16 17.3	60 11.9	58
2	281 48 57.7	N. 0.11	9.9926616	16 9.8	16 2.1	59 19.0	58
3	282 50 6.5	0.25	9.9926684	15 54.1	15 46.3	58 21.4	57
4	283 51 15.4	0.37	9.9926778	15 38.5	15 31.1	57 24.1	56
5	284 52 24.5	0.48	9.9926896	15 24.1	15 17.6	56 31.2	56
6	285 53 33.7	0.57	9.9927038	15 11.6	15 6.1	55 45.2	55
7	286 54 43.0	0.64	9.9927201	15 1.3	14 57.0	55 7.5	55
8	287 55 52.4	0.67	9.9927384	14 53.3	14 50.1	54 38.1	55
9	288 57 1.7	0.68	9.9927587	14 47.5	14 45.4	54 16.8	55
10	289 58 10.9	0.66	9.9927808	14 43.7	14 42.5	54 2.9	55
11	290 59 19.9	0.60	9.9928047	14 41.6	14 41.2	53 55.4	55
12	292 0 28.6	0.52	9.9928302	14 41.2	14 41.5	53 53.7	55
13	293 1 37.0	0.42	9.9928573	14 42.2	14 43.2	53 57.3	54
14	294 2 44.8	0.30	9.9928861	14 44.5	14 46.1	54 5.8	54
15	295 3 52.0	0.17	9.9929164	14 48.2	14 50.5	54 19.3	54
16	296 4 58.6	N. 0.04	9.9929483	14 53.3	14 56.4	54 38.1	54
17	297 6 4.4	S. 0.09	9.9929820	15 0.0	15 3.9	55 2.7	55
18	298 7 9.4	0.21	9.9930175	15 8.3	15 13.2	55 33.3	55
19	299 8 13.5	0.31	9.9930547	15 18.4	15 24.1	56 10.4	56
20	300 9 16.6	0.39	9.9930940	15 30.2	15 36.7	56 53.7	57
21	301 10 18.6	0.44	9.9931354	15 43.5	15 50.6	57 42.5	58
22	302 11 19.7	0.46	9.9931789	15 57.6	16 4.8	58 34.3	59
23	303 12 19.7	0.46	9.9932248	16 11.7	16 18.3	59 25.8	59
24	304 13 18.6	0.42	9.9932731	16 24.3	16 29.7	60 12.3	60
25	305 14 16.3	0.35	9.9933239	16 34.2	16 37.6	60 48.3	60
26	306 15 13.0	0.26	9.9933771	16 39.9	16 41.0	61 9.5	60
27	307 16 8.7	0.15	9.9934329	16 40.8	16 39.2	61 12.6	60
28	308 17 3.3	S. 0.02	9.9934915	16 36.4	16 32.3	60 56.4	60
29	309 17 57.0	N. 0.12	9.9935526	16 27.2	16 21.2	60 22.9	60
30	310 18 49.7	0.25	9.9936162	16 14.3	16 7.0	59 35.6	59
31	311 19 41.6	0.37	9.9936823	15 59.2	15 51.2	58 40.0	59
32	312 20 32.5	N. 0.48	9.9937507	15 43.2	15 35.4	57 41.4	59

## MEAN TIME.

Day of the Month.	THE MOON'S									
	Longitude.				Latitude.				Age.	Meridian
	Noon.		Midnight.		Noon.		Midnight.		Noon.	Passage.
	°	'	"	°	'	"	°	'	"	
1	141	45	28.7	148	59	53.1	S. 0	14	46.8	N. 0 24 29.3
2	156	7	32.7	163	8	17.2	N. 1	2	47.9	1 39 33.2
3	170	2	6.8	176	49	10.0	2	14	15.5	2 46 30.0
4	183	29	42.6	190	4	6.1	3	15	55.9	3 42 18.5
5	196	32	45.5	202	56	8.9	4	5	26.1	4 25 9.9
6	209	14	45.6	215	29	5.7	4	41	24.3	4 54 6.5
7	221	39	38.9	227	46	54.3	5	3	15.0	5 8 49.9
8	233	51	19.6	239	53	20.8	5	10	53.0	5 9 27.9
9	245	53	22.3	251	51	46.3	5	4	38.6	4 56 30.8
10	257	48	52.8	263	44	59.9	4	45	11.6	4 30 48.8
11	269	40	24.8	275	35	23.0	4	13	31.9	3 53 31.7
12	281	30	8.5	287	24	54.5	3	31	0.4	3 6 11.3
13	293	19	54.3	299	15	20.8	2	39	19.1	2 10 39.3
14	305	11	27.6	311	8	28.8	1	40	29.2	1 9 6.3
15	317	6	39.8	323	6	17.2	N. 0	36	49.8	N. 0 3 59.0
16	329	7	39.6	335	11	6.7	S. 0	29	6.2	S. 1 2 4.7
17	341	17	0.8	347	25	45.3	1	34	35.4	2 6 16.7
18	353	37	45.2	359	53	26.6	2	36	46.8	3 5 42.9
19	6	13	17.0	12	37	43.4	3	32	42.8	3 57 23.5
20	19	7	11.8	25	42	6.1	4	19	21.8	4 38 14.7
21	32	22	48.4	39	9	36.4	4	53	39.4	5 5 14.0
22	46	2	42.2	53	2	10.9	5	12	38.2	5 15 33.2
23	60	7	59.9	67	19	57.2	5	13	44.0	5 6 59.3
24	74	37	39.9	82	0	34.8	4	55	13.4	4 38 27.0
25	89	27	58.1	96	58	56.2	4	16	48.4	3 50 34.1
26	104	32	26.7	112	7	20.3	3	20	9.0	2 46 5.6
27	119	42	24.4	127	16	25.2	2	9	4.3	1 29 50.0
28	134	48	10.8	142	16	34.3	S. 0	49	11.6	S. 0 7 58.7
29	149	40	36.0	156	59	25.3	N. 0	32	59.2	N. 1 12 56.6
30	164	12	21.5	171	18	55.3	1	51	12.2	2 27 9.9
31	178	18	47.6	185	11	49.5	3	0	20.4	3 30 20.5
32	191	58	1.9	198	37	33.3	N. 3	56	52.7	N. 4 19 45.0



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Dec.
TUESDAY 1.				THURSDAY		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup>
0	9 36 12.43	N. 14 1 50.8	86.75	0	11 26 54.75	N. 6
1	9 38 38.98	13 53 10.3	87.55	1	11 29 5.37	5 4
2	9 41 5.17	13 44 25.0	88.33	2	11 31 15.71	5 3
3	9 43 31.00	13 35 35.0	89.10	3	11 33 25.78	5 2
4	9 45 56.46	13 26 40.4	89.87	4	11 35 35.59	5 1
5	9 48 21.57	13 17 41.2	90.58	5	11 37 45.14	5
6	9 50 46.31	13 8 37.7	91.32	6	11 39 54.42	4 5
7	9 53 10.69	12 59 29.8	92.03	7	11 42 3.45	4 4
8	9 55 34.71	12 50 17.6	92.72	8	11 44 12.23	4 3
9	9 57 58.36	12 41 1.3	93.40	9	11 46 20.76	4 2
10	10 0 21.66	12 31 40.9	94.05	10	11 48 29.04	4 1
11	10 2 44.60	12 22 16.6	94.72	11	11 50 37.08	3 5
12	10 5 7.17	12 12 48.3	95.33	12	11 52 44.89	3 4
13	10 7 29.39	12 3 16.3	95.97	13	11 54 52.46	3 3
14	10 9 51.25	11 53 40.5	96.57	14	11 56 59.79	3 2
15	10 12 12.76	11 44 1.1	97.17	15	11 59 6.90	3 1
16	10 14 33.91	11 34 18.1	97.73	16	12 1 13.78	3
17	10 16 54.71	11 24 31.7	98.28	17	12 3 20.44	2 5
18	10 19 15.16	11 14 42.0	98.85	18	12 5 26.88	2 4
19	10 21 35.25	11 4 48.9	99.38	19	12 7 33.10	2 3
20	10 23 55.00	10 54 52.6	99.88	20	12 9 39.11	2 2
21	10 26 14.40	10 44 53.3	100.42	21	12 11 44.92	2
22	10 28 33.45	10 34 50.8	100.88	22	12 13 50.52	1 5
23	10 30 52.16	N. 10 24 45.5	101.38	23	12 15 55.92	N. 1
WEDNESDAY 2.				FRIDAY 4.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup>
0	10 33 10.52	N. 10 14 37.2	101.83	0	12 18 1.13	N. 1
1	10 35 28.55	10 4 26.2	102.30	1	12 20 6.14	1
2	10 37 46.23	9 54 12.4	102.73	2	12 22 10.96	1
3	10 40 3.59	9 43 56.0	103.15	3	12 24 15.60	1
4	10 42 20.60	9 33 37.1	103.55	4	12 26 20.05	0 5
5	10 44 37.29	9 23 15.8	103.97	5	12 28 24.32	0 4
6	10 46 53.65	9 12 52.0	104.35	6	12 30 28.42	0 3
7	10 49 9.68	9 2 25.9	104.72	7	12 32 32.34	0 2
8	10 51 25.38	8 51 57.6	105.07	8	12 34 36.10	N. 0
9	10 53 40.77	8 41 27.2	105.42	9	12 36 39.68	S. 0
10	10 55 55.83	8 30 54.7	105.75	10	12 38 43.11	0
11	10 58 10.58	8 20 20.2	106.07	11	12 40 46.38	0
12	11 0 25.01	8 9 43.8	106.37	12	12 42 49.49	0
13	11 2 39.13	7 59 5.6	106.67	13	12 44 52.45	0
14	11 4 52.94	7 48 25.6	106.95	14	12 46 55.26	0
15	11 7 6.45	7 37 43.9	107.23	15	12 48 57.93	1
16	11 9 19.66	7 27 0.5	107.47	16	12 51 0.46	1
17	11 11 32.56	7 16 15.7	107.73	17	12 53 2.85	1
18	11 13 45.17	7 5 29.3	107.95	18	12 55 5.10	1
19	11 15 57.49	6 54 41.6	108.18	19	12 57 7.22	1
20	11 18 9.51	6 43 52.5	108.38	20	12 59 9.21	2
21	11 20 21.25	6 33 2.2	108.58	21	13 1 11.08	2
22	11 22 32.70	6 22 10.7	108.78	22	13 3 12.83	2
23	11 24 43.86	6 11 18.0	108.95	23	13 5 14.46	2
24	11 26 54.75	N. 6 0 24.3		24	13 7 15.97	S. 2

## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 5.			MONDAY 7.			
m s	° ' "	"	h m s	° ' "	"	
7 15 '97	S. 2 43 48 '6	105 '90	0 14 43 13 '26	S. 10 31 47 '6	86 '50	
9 17 '37	2 54 24 '0	105 '63	1 14 45 12 '75	10 40 26 '6	85 '95	
1 18 '67	3 4 57 '8	105 '38	2 14 47 12 '26	10 49 2 '3	85 '42	
3 19 '85	3 15 30 '1	105 '08	3 14 49 11 '80	10 57 34 '8	84 '87	
5 20 '94	3 26 0 '6	104 '82	4 14 51 11 '36	11 6 4 '0	84 '32	
7 21 '93	3 36 29 '5	104 '52	5 14 53 10 '95	11 14 29 '9	83 '77	
9 22 '82	3 46 56 '6	104 '23	6 14 55 10 '57	11 22 52 '5	83 '20	
11 23 '62	3 57 22 '0	103 '92	7 14 57 10 '22	11 31 11 '7	82 '62	
13 24 '33	4 7 45 '5	103 '62	8 14 59 9 '90	11 39 27 '4	82 '07	
15 24 '96	4 18 7 '2	103 '30	9 15 1 9 '61	11 47 39 '8	81 '48	
17 25 '50	4 28 27 '0	102 '98	10 15 3 9 '36	11 55 48 '7	80 '90	
19 25 '97	4 38 44 '9	102 '65	11 15 5 9 '15	12 3 54 '1	80 '32	
21 26 '35	4 49 0 '8	102 '32	12 15 7 8 '97	12 11 56 '0	79 '73	
23 26 '66	4 59 14 '7	101 '98	13 15 9 8 '84	12 19 54 '4	79 '12	
25 26 '91	5 9 26 '6	101 '63	14 15 11 8 '75	12 27 49 '1	78 '53	
27 27 '08	5 19 36 '4	101 '28	15 15 13 8 '71	12 35 40 '3	77 '93	
29 27 '19	5 29 44 '1	100 '92	16 15 15 8 '71	12 43 27 '9	77 '30	
31 27 '24	5 39 49 '6	100 '55	17 15 17 8 '76	12 51 11 '7	76 '72	
1 27 '23	5 49 52 '9	100 '20	18 15 19 8 '86	12 58 52 '0	76 '07	
3 27 '17	5 59 54 '1	99 '80	19 15 21 9 '00	13 6 28 '4	75 '47	
5 27 '05	6 9 52 '9	99 '43	20 15 23 9 '20	13 14 1 '2	74 '83	
7 26 '88	6 19 49 '5	99 '03	21 15 25 9 '46	13 21 30 '2	74 '18	
9 26 '66	6 29 43 '7	98 '65	22 15 27 9 '76	13 28 55 '3	73 '57	
11 26 '40	S. 6 39 35 '6	98 '25	23 15 29 10 '13	S. 13 36 16 '7	72 '92	
SUNDAY 6.			TUESDAY 8.			
15 26 '10	S. 6 49 25 '1	97 '83	0 15 31 10 '54	S. 13 43 34 '2	72 '27	
17 25 '76	6 59 12 '1	97 '43	1 15 33 11 '02	13 50 47 '8	71 '62	
19 25 '39	7 8 56 '7	97 '02	2 15 35 11 '55	13 57 57 '5	70 '97	
1 24 '98	7 18 38 '8	96 '60	3 15 37 12 '14	14 5 3 '3	70 '30	
3 24 '54	7 28 18 '4	96 '15	4 15 39 12 '80	14 12 5 '1	69 '65	
5 24 '07	7 37 55 '3	95 '73	5 15 41 13 '51	14 19 3 '0	68 '97	
7 23 '58	7 47 29 '7	95 '30	6 15 43 14 '29	14 25 56 '8	68 '30	
9 23 '07	7 57 1 '5	94 '85	7 15 45 15 '14	14 32 46 '6	67 '62	
11 22 '53	8 6 30 '6	94 '40	8 15 47 16 '05	14 39 32 '3	66 '93	
13 21 '98	8 15 57 '0	93 '93	9 15 49 17 '02	14 46 13 '9	66 '25	
15 21 '42	8 25 20 '6	93 '48	10 15 51 18 '06	14 52 51 '4	65 '57	
17 20 '84	8 34 41 '5	93 '02	11 15 53 19 '17	14 59 24 '8	64 '87	
19 20 '25	8 43 59 '6	92 '55	12 15 55 20 '34	15 5 54 '0	64 '17	
21 19 '65	8 53 14 '9	92 '07	13 15 57 21 '58	15 12 19 '0	63 '47	
23 19 '05	9 2 27 '3	91 '58	14 15 59 22 '90	15 18 39 '8	62 '77	
25 18 '45	9 11 36 '8	91 '12	15 16 1 24 '28	15 24 56 '4	62 '05	
27 17 '85	9 20 43 '5	90 '60	16 16 3 25 '73	15 31 8 '7	61 '33	
29 17 '25	9 29 47 '1	90 '12	17 16 5 27 '25	15 37 16 '7	60 '60	
31 16 '65	9 38 47 '8	89 '62	18 16 7 28 '85	15 43 20 '3	59 '90	
3 16 '06	9 47 45 '5	89 '10	19 16 9 30 '52	15 49 19 '7	59 '15	
5 15 '47	9 56 40 '1	88 '60	20 16 11 32 '25	15 55 14 '6	58 '43	
7 14 '90	10 5 31 '7	88 '07	21 16 13 34 '06	16 1 5 '2	57 '70	
9 14 '34	10 14 20 '1	87 '55	22 16 15 35 '95	16 6 51 '4	56 '95	
11 13 '80	10 23 5 '4	87 '03	23 16 17 37 '90	16 12 33 '1	56 '22	
13 13 '26	S. 10 31 47 '6		24 16 19 39 '93	S. 16 18 10 '4		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10".	Hour.	Right Ascension.	Declination.
WEDNESDAY 9.				FRIDAY 11.		
0	h m s 16 19 39.93	S. 16° 18' 10".4	55.47	0	h m s 17 58 37.25	S. 19° 13' 51".4
1	16 21 42.04	16 23 43.2	54.72	1	18 0 42.29	19 15 51.4
2	16 23 44.21	16 29 11.5	53.95	2	18 2 47.37	19 16 51.4
3	16 25 46.46	16 34 35.2	53.20	3	18 4 52.48	19 18 11.4
4	16 27 48.79	16 39 54.4	52.43	4	18 6 57.62	19 19 31.4
5	16 29 51.18	16 45 9.0	51.68	5	18 9 2.79	19 20 51.4
6	16 31 53.65	16 50 19.1	50.90	6	18 11 7.99	19 22 11.4
7	16 33 56.20	16 55 24.5	50.12	7	18 13 13.22	19 23 31.4
8	16 35 58.82	17 0 25.2	49.35	8	18 15 18.47	19 24 51.4
9	16 38 1.51	17 5 21.3	48.57	9	18 17 23.74	19 26 11.4
10	16 40 4.27	17 10 12.7	47.78	10	18 19 29.04	19 27 31.4
11	16 42 7.11	17 14 59.4	47.00	11	18 21 34.37	19 28 51.4
12	16 44 10.01	17 19 41.4	46.20	12	18 23 39.71	19 30 11.4
13	16 46 12.99	17 24 18.6	45.42	13	18 25 45.07	19 31 31.4
14	16 48 16.04	17 28 51.1	44.62	14	18 27 50.44	19 32 51.4
15	16 50 19.16	17 33 18.8	43.80	15	18 29 55.82	19 34 11.4
16	16 52 22.36	17 37 41.6	43.02	16	18 32 1.22	19 35 31.4
17	16 54 25.62	17 41 59.7	42.18	17	18 34 6.63	19 36 51.4
18	16 56 28.95	17 46 12.8	41.40	18	18 36 12.04	19 38 11.4
19	16 58 32.35	17 50 21.2	40.57	19	18 38 17.46	19 39 31.4
20	17 0 35.82	17 54 24.6	39.75	20	18 40 22.89	19 40 51.4
21	17 2 39.36	17 58 23.1	38.93	21	18 42 28.32	19 42 11.4
22	17 4 42.97	18 2 16.7	38.12	22	18 44 33.75	19 43 31.4
23	17 6 46.64	S. 18° 6' 5.4	37.28	23	18 46 39.18	S. 19° 27' 4.4
THURSDAY 10.				SATURDAY 12.		
0	h m s 17 8 50.37	S. 18° 9' 49.1	36.45	0	h m s 18 48 44.61	S. 19° 27' 1.4
1	17 10 54.17	18 13 27.8	35.63	1	18 50 50.03	19 28 21.4
2	17 12 58.04	18 17 1.6	34.78	2	18 52 55.45	19 29 41.4
3	17 15 1.97	18 20 30.3	33.95	3	18 55 0.86	19 30 61.4
4	17 17 5.96	18 23 54.0	33.12	4	18 57 6.26	19 31 21.4
5	17 19 10.01	18 27 12.7	32.27	5	18 59 11.65	19 32 41.4
6	17 21 14.13	18 30 26.3	31.42	6	19 1 17.03	19 33 61.4
7	17 23 18.30	18 33 34.8	30.58	7	19 3 22.39	19 34 21.4
8	17 25 22.53	18 36 38.3	29.72	8	19 5 27.74	19 35 41.4
9	17 27 26.82	18 39 36.6	28.88	9	19 7 33.07	19 36 61.4
10	17 29 31.17	18 42 29.9	28.02	10	19 9 38.38	19 37 21.4
11	17 31 35.57	18 45 18.0	27.15	11	19 11 43.67	19 38 41.4
12	17 33 40.03	18 48 0.9	26.30	12	19 13 48.93	19 39 61.4
13	17 35 44.54	18 50 38.7	25.43	13	19 15 54.17	19 40 21.4
14	17 37 49.10	18 53 11.3	24.58	14	19 17 59.38	19 41 41.4
15	17 39 53.71	18 55 38.8	23.70	15	19 20 4.57	19 42 61.4
16	17 41 58.37	18 58 1.0	22.85	16	19 22 9.72	19 43 21.4
17	17 44 3.07	19 0 18.1	21.97	17	19 24 14.84	19 44 41.4
18	17 46 7.83	19 2 29.9	21.10	18	19 26 19.93	19 45 61.4
19	17 48 12.63	19 4 36.5	20.22	19	19 28 24.99	19 46 21.4
20	17 50 17.47	19 6 37.8	19.35	20	19 30 30.00	18 59 41.4
21	17 52 22.35	19 8 33.9	18.48	21	19 32 34.98	18 56 41.4
22	17 54 27.28	19 10 24.8	17.58	22	19 34 39.92	18 54 21.4
23	17 56 32.24	19 12 10.3	16.72	23	19 36 44.82	18 51 51.4
24	17 58 37.25	S. 19° 13' 50.6		24	19 38 49.68	S. 18° 49' 1.4

## MEAN TIME.

## MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 13.				TUESDAY 15.		
19 <sup>h</sup> 68 <sup>m</sup> S. 18 <sup>o</sup> 49 <sup>i</sup> 15 <sup>u</sup> 8	26 <sup>u</sup> 82		0	21 <sup>h</sup> 17 <sup>m</sup> 29 <sup>s</sup> 25 S. 15 <sup>o</sup> 7 <sup>i</sup> 59 <sup>u</sup> 7	64 <sup>u</sup> 78	
54 <sup>h</sup> 49 <sup>m</sup> 18 <sup>o</sup> 46 <sup>i</sup> 34 <sup>u</sup> 9	27 <sup>u</sup> 70		1	21 <sup>h</sup> 19 <sup>m</sup> 30 <sup>s</sup> 73	15 <sup>o</sup> 1 <sup>i</sup> 31 <sup>u</sup> 0	65 <sup>u</sup> 47
59 <sup>h</sup> 26 <sup>m</sup> 18 <sup>o</sup> 43 <sup>i</sup> 48 <sup>u</sup> 7	28 <sup>u</sup> 55		2	21 <sup>h</sup> 21 <sup>m</sup> 32 <sup>s</sup> 13	14 <sup>o</sup> 54 <sup>i</sup> 58 <sup>u</sup> 2	66 <sup>u</sup> 17
3 <sup>h</sup> 98 <sup>m</sup> 18 <sup>o</sup> 40 <sup>i</sup> 57 <sup>u</sup> 4	29 <sup>u</sup> 42		3	21 <sup>h</sup> 23 <sup>m</sup> 33 <sup>s</sup> 45	14 <sup>o</sup> 48 <sup>i</sup> 21 <sup>u</sup> 2	66 <sup>u</sup> 85
8 <sup>h</sup> 65 <sup>m</sup> 18 <sup>o</sup> 38 <sup>i</sup> 0 <sup>u</sup> 9	30 <sup>u</sup> 27		4	21 <sup>h</sup> 25 <sup>m</sup> 34 <sup>s</sup> 69	14 <sup>o</sup> 41 <sup>i</sup> 40 <sup>u</sup> 1	67 <sup>u</sup> 52
13 <sup>h</sup> 27 <sup>m</sup> 18 <sup>o</sup> 34 <sup>i</sup> 59 <sup>u</sup> 3	31 <sup>u</sup> 12		5	21 <sup>h</sup> 27 <sup>m</sup> 35 <sup>s</sup> 85	14 <sup>o</sup> 34 <sup>i</sup> 55 <sup>u</sup> 0	68 <sup>u</sup> 20
17 <sup>h</sup> 84 <sup>m</sup> 18 <sup>o</sup> 31 <sup>i</sup> 52 <sup>u</sup> 6	31 <sup>u</sup> 98		6	21 <sup>h</sup> 29 <sup>m</sup> 36 <sup>s</sup> 93	14 <sup>o</sup> 28 <sup>i</sup> 5 <sup>u</sup> 8	68 <sup>u</sup> 87
22 <sup>h</sup> 35 <sup>m</sup> 18 <sup>o</sup> 28 <sup>i</sup> 40 <sup>u</sup> 7	32 <sup>u</sup> 83		7	21 <sup>h</sup> 31 <sup>m</sup> 37 <sup>s</sup> 94	14 <sup>o</sup> 21 <sup>i</sup> 12 <sup>u</sup> 6	69 <sup>u</sup> 52
26 <sup>h</sup> 81 <sup>m</sup> 18 <sup>o</sup> 25 <sup>i</sup> 23 <sup>u</sup> 7	33 <sup>u</sup> 67		8	21 <sup>h</sup> 33 <sup>m</sup> 38 <sup>s</sup> 86	14 <sup>o</sup> 14 <sup>i</sup> 15 <sup>u</sup> 5	70 <sup>u</sup> 18
31 <sup>h</sup> 22 <sup>m</sup> 18 <sup>o</sup> 22 <sup>i</sup> 1 <sup>u</sup> 7	34 <sup>u</sup> 53		9	21 <sup>h</sup> 35 <sup>m</sup> 39 <sup>s</sup> 71	14 <sup>o</sup> 7 <sup>i</sup> 14 <sup>u</sup> 4	70 <sup>u</sup> 83
35 <sup>h</sup> 57 <sup>m</sup> 18 <sup>o</sup> 18 <sup>i</sup> 34 <sup>u</sup> 5	35 <sup>u</sup> 37		10	21 <sup>h</sup> 37 <sup>m</sup> 40 <sup>s</sup> 48	14 <sup>o</sup> 0 <sup>i</sup> 9 <sup>u</sup> 4	71 <sup>u</sup> 48
39 <sup>h</sup> 86 <sup>m</sup> 18 <sup>o</sup> 15 <sup>i</sup> 2 <sup>u</sup> 3	36 <sup>u</sup> 20		11	21 <sup>h</sup> 39 <sup>m</sup> 41 <sup>s</sup> 18	13 <sup>o</sup> 53 <sup>i</sup> 0 <sup>u</sup> 5	72 <sup>u</sup> 13
44 <sup>h</sup> 09 <sup>m</sup> 18 <sup>o</sup> 11 <sup>i</sup> 25 <sup>u</sup> 1	37 <sup>u</sup> 05		12	21 <sup>h</sup> 41 <sup>m</sup> 41 <sup>s</sup> 80	13 <sup>o</sup> 45 <sup>i</sup> 47 <sup>u</sup> 7	72 <sup>u</sup> 77
48 <sup>h</sup> 26 <sup>m</sup> 18 <sup>o</sup> 7 <sup>i</sup> 42 <sup>u</sup> 8	37 <sup>u</sup> 87		13	21 <sup>h</sup> 43 <sup>m</sup> 42 <sup>s</sup> 34	13 <sup>o</sup> 38 <sup>i</sup> 31 <sup>u</sup> 1	73 <sup>u</sup> 40
52 <sup>h</sup> 37 <sup>m</sup> 18 <sup>o</sup> 3 <sup>i</sup> 55 <sup>u</sup> 6	38 <sup>u</sup> 72		14	21 <sup>h</sup> 45 <sup>m</sup> 42 <sup>s</sup> 81	13 <sup>o</sup> 31 <sup>i</sup> 10 <sup>u</sup> 7	74 <sup>u</sup> 02
56 <sup>h</sup> 42 <sup>m</sup> 18 <sup>o</sup> 0 <sup>i</sup> 3 <sup>u</sup> 3	39 <sup>u</sup> 53		15	21 <sup>h</sup> 47 <sup>m</sup> 43 <sup>s</sup> 21	13 <sup>o</sup> 23 <sup>i</sup> 46 <sup>u</sup> 6	74 <sup>u</sup> 65
0 <sup>h</sup> 40 <sup>m</sup> 17 <sup>o</sup> 56 <sup>i</sup> 6 <sup>u</sup> 1	40 <sup>u</sup> 37		16	21 <sup>h</sup> 49 <sup>m</sup> 43 <sup>s</sup> 54	13 <sup>o</sup> 16 <sup>i</sup> 18 <sup>u</sup> 7	75 <sup>u</sup> 27
4 <sup>h</sup> 32 <sup>m</sup> 17 <sup>o</sup> 52 <sup>i</sup> 3 <sup>u</sup> 9	41 <sup>u</sup> 18		17	21 <sup>h</sup> 51 <sup>m</sup> 43 <sup>s</sup> 79	13 <sup>o</sup> 8 <sup>i</sup> 47 <sup>u</sup> 1	75 <sup>u</sup> 87
8 <sup>h</sup> 17 <sup>m</sup> 17 <sup>o</sup> 47 <sup>i</sup> 56 <sup>u</sup> 8	42 <sup>u</sup> 02		18	21 <sup>h</sup> 53 <sup>m</sup> 43 <sup>s</sup> 97	13 <sup>o</sup> 1 <sup>i</sup> 11 <sup>u</sup> 9	76 <sup>u</sup> 48
11 <sup>h</sup> 95 <sup>m</sup> 17 <sup>o</sup> 43 <sup>i</sup> 44 <sup>u</sup> 7	42 <sup>u</sup> 82		19	21 <sup>h</sup> 55 <sup>m</sup> 44 <sup>s</sup> 08	12 <sup>o</sup> 53 <sup>i</sup> 33 <sup>u</sup> 0	77 <sup>u</sup> 08
15 <sup>h</sup> 67 <sup>m</sup> 17 <sup>o</sup> 39 <sup>i</sup> 27 <sup>u</sup> 8	43 <sup>u</sup> 62		20	21 <sup>h</sup> 57 <sup>m</sup> 44 <sup>s</sup> 11	12 <sup>o</sup> 45 <sup>i</sup> 50 <sup>u</sup> 5	77 <sup>u</sup> 68
19 <sup>h</sup> 31 <sup>m</sup> 17 <sup>o</sup> 35 <sup>i</sup> 6 <sup>u</sup> 1	44 <sup>u</sup> 45		21	21 <sup>h</sup> 59 <sup>m</sup> 44 <sup>s</sup> 08	12 <sup>o</sup> 38 <sup>i</sup> 4 <sup>u</sup> 4	78 <sup>u</sup> 27
22 <sup>h</sup> 89 <sup>m</sup> 17 <sup>o</sup> 30 <sup>i</sup> 39 <sup>u</sup> 4	45 <sup>u</sup> 23		22	22 <sup>h</sup> 1 <sup>m</sup> 43 <sup>s</sup> 99	12 <sup>o</sup> 30 <sup>i</sup> 14 <sup>u</sup> 8	78 <sup>u</sup> 87
26 <sup>h</sup> 40 <sup>m</sup> S. 17 <sup>o</sup> 26 <sup>i</sup> 8 <sup>u</sup> 0	46 <sup>u</sup> 05		23	22 <sup>h</sup> 3 <sup>m</sup> 43 <sup>s</sup> 82	S. 12 <sup>o</sup> 22 <sup>i</sup> 21 <sup>u</sup> 6	79 <sup>u</sup> 43
MONDAY 14.				WEDNESDAY 16.		
29 <sup>h</sup> 83 <sup>m</sup> S. 17 <sup>o</sup> 21 <sup>i</sup> 31 <sup>u</sup> 7	46 <sup>u</sup> 83		0	22 <sup>h</sup> 5 <sup>m</sup> 43 <sup>s</sup> 59	S. 12 <sup>o</sup> 14 <sup>i</sup> 25 <sup>u</sup> 0	80 <sup>u</sup> 02
33 <sup>h</sup> 19 <sup>m</sup> 17 <sup>o</sup> 16 <sup>i</sup> 50 <sup>u</sup> 7	47 <sup>u</sup> 63		1	22 <sup>h</sup> 7 <sup>m</sup> 43 <sup>s</sup> 29	12 <sup>o</sup> 6 <sup>i</sup> 24 <sup>u</sup> 9	80 <sup>u</sup> 58
36 <sup>h</sup> 48 <sup>m</sup> 17 <sup>o</sup> 12 <sup>i</sup> 4 <sup>u</sup> 9	48 <sup>u</sup> 43		2	22 <sup>h</sup> 9 <sup>m</sup> 42 <sup>s</sup> 94	11 <sup>o</sup> 58 <sup>i</sup> 21 <sup>u</sup> 4	81 <sup>u</sup> 15
39 <sup>h</sup> 70 <sup>m</sup> 17 <sup>o</sup> 7 <sup>i</sup> 14 <sup>u</sup> 3	49 <sup>u</sup> 20		3	22 <sup>h</sup> 11 <sup>m</sup> 42 <sup>s</sup> 51	11 <sup>o</sup> 50 <sup>i</sup> 14 <sup>u</sup> 5	81 <sup>u</sup> 72
42 <sup>h</sup> 84 <sup>m</sup> 17 <sup>o</sup> 2 <sup>i</sup> 19 <sup>u</sup> 1	50 <sup>u</sup> 00		4	22 <sup>h</sup> 13 <sup>m</sup> 42 <sup>s</sup> 03	11 <sup>o</sup> 42 <sup>i</sup> 4 <sup>u</sup> 2	82 <sup>u</sup> 25
45 <sup>h</sup> 91 <sup>m</sup> 16 <sup>o</sup> 57 <sup>i</sup> 19 <sup>u</sup> 1	50 <sup>u</sup> 77		5	22 <sup>h</sup> 15 <sup>m</sup> 41 <sup>s</sup> 49	11 <sup>o</sup> 33 <sup>i</sup> 50 <sup>u</sup> 7	82 <sup>u</sup> 82
48 <sup>h</sup> 90 <sup>m</sup> 16 <sup>o</sup> 52 <sup>i</sup> 14 <sup>u</sup> 5	51 <sup>u</sup> 55		6	22 <sup>h</sup> 17 <sup>m</sup> 40 <sup>s</sup> 89	11 <sup>o</sup> 25 <sup>i</sup> 33 <sup>u</sup> 8	83 <sup>u</sup> 35
51 <sup>h</sup> 81 <sup>m</sup> 16 <sup>o</sup> 47 <sup>i</sup> 5 <sup>u</sup> 2	52 <sup>u</sup> 32		7	22 <sup>h</sup> 19 <sup>m</sup> 40 <sup>s</sup> 23	11 <sup>o</sup> 17 <sup>i</sup> 13 <sup>u</sup> 7	83 <sup>u</sup> 90
54 <sup>h</sup> 65 <sup>m</sup> 16 <sup>o</sup> 41 <sup>i</sup> 51 <sup>u</sup> 3	53 <sup>u</sup> 08		8	22 <sup>h</sup> 21 <sup>m</sup> 39 <sup>s</sup> 52	11 <sup>o</sup> 8 <sup>i</sup> 50 <sup>u</sup> 3	84 <sup>u</sup> 42
57 <sup>h</sup> 41 <sup>m</sup> 16 <sup>o</sup> 36 <sup>i</sup> 32 <sup>u</sup> 8	53 <sup>u</sup> 85		9	22 <sup>h</sup> 23 <sup>m</sup> 38 <sup>s</sup> 75	11 <sup>o</sup> 0 <sup>i</sup> 23 <sup>u</sup> 8	84 <sup>u</sup> 95
0 <sup>h</sup> 09 <sup>m</sup> 16 <sup>o</sup> 31 <sup>i</sup> 9 <sup>u</sup> 7	54 <sup>u</sup> 60		10	22 <sup>h</sup> 25 <sup>m</sup> 37 <sup>s</sup> 93	10 <sup>o</sup> 51 <sup>i</sup> 54 <sup>u</sup> 1	85 <sup>u</sup> 47
2 <sup>h</sup> 69 <sup>m</sup> 16 <sup>o</sup> 25 <sup>i</sup> 42 <sup>u</sup> 1	55 <sup>u</sup> 37		11	22 <sup>h</sup> 27 <sup>m</sup> 37 <sup>s</sup> 06	10 <sup>o</sup> 43 <sup>i</sup> 21 <sup>u</sup> 3	85 <sup>u</sup> 98
5 <sup>h</sup> 21 <sup>m</sup> 16 <sup>o</sup> 20 <sup>i</sup> 9 <sup>u</sup> 9	56 <sup>u</sup> 12		12	22 <sup>h</sup> 29 <sup>m</sup> 36 <sup>s</sup> 14	10 <sup>o</sup> 34 <sup>i</sup> 45 <sup>u</sup> 4	86 <sup>u</sup> 48
7 <sup>h</sup> 65 <sup>m</sup> 16 <sup>o</sup> 14 <sup>i</sup> 33 <sup>u</sup> 2	56 <sup>u</sup> 87		13	22 <sup>h</sup> 31 <sup>m</sup> 35 <sup>s</sup> 17	10 <sup>o</sup> 26 <sup>i</sup> 6 <sup>u</sup> 5	87 <sup>u</sup> 00
10 <sup>h</sup> 02 <sup>m</sup> 16 <sup>o</sup> 8 <sup>i</sup> 52 <sup>u</sup> 0	57 <sup>u</sup> 60		14	22 <sup>h</sup> 33 <sup>m</sup> 34 <sup>s</sup> 16	10 <sup>o</sup> 17 <sup>i</sup> 24 <sup>u</sup> 5	87 <sup>u</sup> 50
12 <sup>h</sup> 30 <sup>m</sup> 16 <sup>o</sup> 3 <sup>i</sup> 6 <sup>u</sup> 4	58 <sup>u</sup> 33		15	22 <sup>h</sup> 35 <sup>m</sup> 33 <sup>s</sup> 10	10 <sup>o</sup> 8 <sup>i</sup> 39 <sup>u</sup> 5	87 <sup>u</sup> 98
14 <sup>h</sup> 51 <sup>m</sup> 15 <sup>o</sup> 57 <sup>i</sup> 16 <sup>u</sup> 4	59 <sup>u</sup> 08		16	22 <sup>h</sup> 37 <sup>m</sup> 31 <sup>s</sup> 99	9 <sup>o</sup> 59 <sup>i</sup> 51 <sup>u</sup> 6	88 <sup>u</sup> 47
16 <sup>h</sup> 63 <sup>m</sup> 15 <sup>o</sup> 51 <sup>i</sup> 21 <sup>u</sup> 9	59 <sup>u</sup> 80		17	22 <sup>h</sup> 39 <sup>m</sup> 30 <sup>s</sup> 85	9 <sup>o</sup> 51 <sup>i</sup> 0 <sup>u</sup> 8	88 <sup>u</sup> 95
18 <sup>h</sup> 68 <sup>m</sup> 15 <sup>o</sup> 45 <sup>i</sup> 23 <sup>u</sup> 1	60 <sup>u</sup> 53		18	22 <sup>h</sup> 41 <sup>m</sup> 29 <sup>s</sup> 66	9 <sup>o</sup> 42 <sup>i</sup> 7 <sup>u</sup> 1	89 <sup>u</sup> 43
20 <sup>h</sup> 64 <sup>m</sup> 15 <sup>o</sup> 39 <sup>i</sup> 19 <sup>u</sup> 9	61 <sup>u</sup> 25		19	22 <sup>h</sup> 43 <sup>m</sup> 28 <sup>s</sup> 44	9 <sup>o</sup> 33 <sup>i</sup> 10 <sup>u</sup> 5	89 <sup>u</sup> 88
22 <sup>h</sup> 52 <sup>m</sup> 15 <sup>o</sup> 33 <sup>i</sup> 12 <sup>u</sup> 4	61 <sup>u</sup> 97		20	22 <sup>h</sup> 45 <sup>m</sup> 27 <sup>s</sup> 18	9 <sup>o</sup> 24 <sup>i</sup> 11 <sup>u</sup> 2	90 <sup>u</sup> 37
24 <sup>h</sup> 32 <sup>m</sup> 15 <sup>o</sup> 27 <sup>i</sup> 0 <sup>u</sup> 6	62 <sup>u</sup> 68		21	22 <sup>h</sup> 47 <sup>m</sup> 25 <sup>s</sup> 89	9 <sup>o</sup> 15 <sup>i</sup> 9 <sup>u</sup> 0	90 <sup>u</sup> 82
26 <sup>h</sup> 05 <sup>m</sup> 15 <sup>o</sup> 20 <sup>i</sup> 44 <sup>u</sup> 5	63 <sup>u</sup> 38		22	22 <sup>h</sup> 49 <sup>m</sup> 24 <sup>s</sup> 56	9 <sup>o</sup> 6 <sup>i</sup> 4 <sup>u</sup> 1	91 <sup>u</sup> 27
27 <sup>h</sup> 69 <sup>m</sup> 15 <sup>o</sup> 14 <sup>i</sup> 24 <sup>u</sup> 2	64 <sup>u</sup> 08		23	22 <sup>h</sup> 51 <sup>m</sup> 23 <sup>s</sup> 21	8 <sup>o</sup> 56 <sup>i</sup> 56 <sup>u</sup> 5	91 <sup>u</sup> 72
29 <sup>h</sup> 25 <sup>m</sup> S. 15 <sup>o</sup> 7 <sup>i</sup> 59 <sup>u</sup> 7			24	22 <sup>h</sup> 53 <sup>m</sup> 21 <sup>s</sup> 82	S. 8 <sup>o</sup> 47 <sup>i</sup> 46 <sup>u</sup> 2	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
THURSDAY 17.				SATURDAY 19.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	22 53 21.82	S. 8 47 46.2	92.15	0	0 28 27.45	S. 0 47 0.0
1	22 55 20.41	8 38 33.3	92.60	1	0 30 27.66	0 36 24.0
2	22 57 18.97	8 29 17.7	93.02	2	0 32 27.98	0 25 47.2
3	22 59 17.51	8 19 59.6	93.43	3	0 34 28.41	0 15 9.7
4	23 1 16.03	8 10 39.0	93.87	4	0 36 28.94	S. 0 4 31.6
5	23 3 14.54	8 1 15.8	94.27	5	0 38 29.59	N. 0 6 7.2
6	23 5 13.02	7 51 50.2	94.67	6	0 40 30.36	0 16 46.6
7	23 7 11.50	7 42 22.2	95.08	7	0 42 31.25	0 27 26.4
8	23 9 9.96	7 32 51.7	95.47	8	0 44 32.26	0 38 6.8
9	23 11 8.41	7 23 18.9	95.85	9	0 46 33.40	0 48 47.7
10	23 13 6.86	7 13 43.8	96.23	10	0 48 34.66	0 59 28.9
11	23 15 5.30	7 4 6.4	96.60	11	0 50 36.07	1 10 10.5
12	23 17 3.73	6 54 26.8	96.97	12	0 52 37.61	1 20 52.4
13	23 19 2.17	6 44 45.0	97.33	13	0 54 39.29	1 31 34.6
14	23 21 0.60	6 35 1.0	97.70	14	0 56 41.12	1 42 17.0
15	23 22 59.05	6 25 14.8	98.03	15	0 58 43.09	1 52 59.5
16	23 24 57.50	6 15 26.6	98.38	16	1 0 45.21	2 3 42.2
17	23 26 55.95	6 5 36.3	98.73	17	1 2 47.48	2 14 24.9
18	23 28 54.42	5 55 43.9	99.05	18	1 4 49.91	2 25 7.7
19	23 30 52.91	5 45 49.6	99.38	19	1 6 52.51	2 35 50.5
20	23 32 51.41	5 35 53.3	99.70	20	1 8 55.26	2 46 33.2
21	23 34 49.93	5 25 55.1	100.02	21	1 10 58.19	2 57 15.7
22	23 36 48.47	5 15 55.0	100.32	22	1 13 1.28	3 7 58.1
23	23 38 47.04	S. 5 5 53.1	100.62	23	1 15 4.55	N. 3 18 40.3
FRIDAY 18.				SUNDAY 20.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	23 40 45.63	S. 4 55 49.4	100.92	0	1 17 7.99	N. 3 29 22.2
1	23 42 44.26	4 45 43.9	101.20	1	1 19 11.62	3 40 3.8
2	23 44 42.91	4 35 36.7	101.50	2	1 21 15.42	3 50 45.0
3	23 46 41.61	4 25 27.7	101.75	3	1 23 19.42	4 1 25.8
4	23 48 40.34	4 15 17.2	102.03	4	1 25 23.60	4 12 6.1
5	23 50 39.11	4 5 5.0	102.30	5	1 27 27.98	4 22 45.9
6	23 52 37.93	3 54 51.2	102.55	6	1 29 32.56	4 33 25.1
7	23 54 36.79	3 44 35.9	102.80	7	1 31 37.34	4 44 3.7
8	23 56 35.70	3 34 19.1	103.03	8	1 33 42.32	4 54 41.6
9	23 58 34.66	3 24 0.9	103.28	9	1 35 47.51	5 5 18.7
10	0 0 33.68	3 13 41.2	103.50	10	1 37 52.91	5 15 55.1
11	0 2 32.76	3 3 20.2	103.73	11	1 39 58.52	5 26 30.6
12	0 4 31.89	2 52 57.8	103.95	12	1 42 4.35	5 37 5.2
13	0 6 31.09	2 42 34.1	104.15	13	1 44 10.40	5 47 38.9
14	0 8 30.37	2 32 9.2	104.35	14	1 46 16.68	5 58 11.5
15	0 10 29.71	2 21 43.1	104.55	15	1 48 23.18	6 8 43.1
16	0 12 29.12	2 11 15.8	104.75	16	1 50 29.91	6 19 13.5
17	0 14 28.61	2 0 47.3	104.92	17	1 52 36.88	6 29 42.8
18	0 16 28.18	1 50 17.8	105.10	18	1 54 44.08	6 40 10.8
19	0 18 27.84	1 39 47.2	105.27	19	1 56 51.53	6 50 37.5
20	0 20 27.58	1 29 15.6	105.42	20	1 58 59.22	7 1 2.8
21	0 22 27.40	1 18 43.1	105.58	21	2 0 7.15	7 11 26.8
22	0 24 27.32	1 8 9.6	105.73	22	2 3 15.33	7 21 49.2
23	0 26 27.34	0 57 35.2	105.87	23	2 5 23.77	7 32 10.2
24	0 28 27.45	S. 0 47 0.0		24	2 7 32.47	N. 7 42 29.5



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
<i>MONDAY 21.</i>				<i>WEDNESDAY 23.</i>		
h m s	° ' "	"		h m s	° ' "	"
2 7 32.47	N. 7 42 29.5	102.95	0	3 56 23.13	N. 15 4 44.0	76.12
2 9 41.43	7 52 47.2	102.65	1	3 58 47.32	15 12 20.7	75.27
2 11 50.64	8 3 3.1	102.37	2	4 1 11.86	15 19 52.3	74.37
2 14 0.13	8 13 17.3	102.05	3	4 3 36.74	15 27 18.5	73.48
2 16 9.88	8 23 29.6	101.73	4	4 6 1.98	15 34 39.4	72.57
2 18 19.90	8 33 40.0	101.42	5	4 8 27.56	15 41 54.8	71.67
2 20 30.20	8 43 48.5	101.05	6	4 10 53.48	15 49 4.8	70.72
2 22 40.78	8 53 54.8	100.72	7	4 13 19.75	15 56 9.1	69.78
2 24 51.64	9 3 59.1	100.35	8	4 15 46.36	16 3 7.8	68.82
2 27 2.78	9 14 1.2	99.98	9	4 18 13.32	16 10 0.7	67.83
2 29 14.21	9 24 1.1	99.60	10	4 20 40.61	16 16 47.7	66.87
2 31 25.93	9 33 58.7	99.20	11	4 23 8.25	16 23 28.9	65.87
2 33 37.94	9 43 53.9	98.80	12	4 25 36.22	16 30 4.1	64.85
2 35 50.24	9 53 46.7	98.37	13	4 28 4.53	16 36 33.2	63.83
2 38 2.85	10 3 36.9	97.95	14	4 30 33.18	16 42 56.2	62.80
2 40 15.75	10 13 24.6	97.50	15	4 33 2.16	16 49 13.0	61.75
2 42 28.95	10 23 9.6	97.07	16	4 35 31.46	16 55 23.5	60.68
17 2 44 42.46	10 32 52.0	96.58	17	4 38 1.10	17 1 27.6	59.60
18 2 46 56.27	10 42 31.5	96.12	18	4 40 31.06	17 7 25.2	58.52
19 2 49 10.40	10 52 8.2	95.63	19	4 43 1.35	17 13 16.3	57.43
20 2 51 24.84	11 1 42.0	95.13	20	4 45 31.96	17 19 0.9	56.30
21 2 53 39.59	11 11 12.8	94.62	21	4 48 2.89	17 24 38.7	55.20
22 2 55 54.65	11 20 40.5	94.10	22	4 50 34.12	17 30 9.9	54.05
23 2 58 10.04	N. 11 30 5.1	93.57	23	4 53 5.68	N. 17 35 34.2	52.90
<i>TUESDAY 22.</i>				<i>THURSDAY 24.</i>		
h m s	° ' "	"		h m s	° ' "	"
0 3 0 25.74	N. 11 39 26.5	93.02	0	4 55 37.55	N. 17 40 51.6	51.75
1 3 2 41.77	11 48 44.6	92.47	1	4 58 9.72	17 46 2.1	50.57
2 3 4 58.12	11 57 59.4	91.90	2	5 0 42.20	17 51 5.5	49.40
3 3 7 14.80	12 7 10.8	91.30	3	5 3 14.97	17 56 1.9	48.18
4 3 9 31.81	12 16 18.6	90.72	4	5 5 48.05	18 0 51.0	47.00
5 3 11 49.15	12 25 22.9	90.10	5	5 8 21.41	18 5 33.0	45.77
6 3 14 6.82	12 34 23.5	89.48	6	5 10 55.06	18 10 7.6	44.55
7 3 16 24.83	12 43 20.4	88.87	7	5 13 28.99	18 14 34.9	43.30
8 3 18 43.17	12 52 13.6	88.20	8	5 16 3.21	18 18 54.7	42.05
9 3 21 1.84	13 1 2.8	87.55	9	5 18 37.70	18 23 7.0	40.80
10 3 23 20.86	13 9 48.1	86.87	10	5 21 12.46	18 27 11.8	39.52
11 3 25 40.21	13 18 29.3	86.20	11	5 23 47.49	18 31 8.9	38.25
12 3 27 59.91	13 27 6.5	85.50	12	5 26 22.77	18 34 58.4	36.95
13 3 30 19.95	13 35 39.5	84.78	13	5 28 58.32	18 38 40.1	35.65
14 3 32 40.33	13 44 8.2	84.07	14	5 31 34.12	18 42 14.0	34.35
15 3 35 1.05	13 52 32.6	83.33	15	5 34 10.16	18 45 40.1	33.02
16 3 37 22.12	14 0 52.6	82.57	16	5 36 46.45	18 48 58.2	31.68
17 3 39 43.53	14 9 8.0	81.82	17	5 39 22.97	18 52 8.3	30.37
18 3 42 5.29	14 17 18.9	81.05	18	5 41 59.72	18 55 10.5	29.00
19 3 44 27.40	14 25 25.2	80.25	19	5 44 36.69	18 58 4.5	27.67
20 3 46 49.85	14 33 26.7	79.45	20	5 47 13.89	19 0 50.5	26.28
21 3 49 12.65	14 41 23.4	78.65	21	5 49 51.29	19 3 28.2	24.93
22 3 51 35.80	14 49 15.3	77.82	22	5 52 28.90	19 5 57.8	23.53
23 3 53 59.30	14 57 2.2	76.97	23	5 55 6.72	19 8 19.0	22.17
24 3 56 23.13	N. 15 4 44.0		24	5 57 44.73	N. 19 10 32.0	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.
FRIDAY 25.				SUNDAY 27.		
0	5 57 44.73	N. 19 10 32.0	20.77	0	8 5 36.85	N. 18 7 23.
1	6 0 22.93	19 12 36.6	19.37	1	8 8 15.46	18 2 35.
2	6 3 1.30	19 14 32.8	17.97	2	8 10 53.91	17 57 38.
3	6 5 39.85	19 16 20.6	16.55	3	8 13 32.18	17 52 34.
4	6 8 18.57	19 17 59.9	15.13	4	8 16 10.27	17 47 21.
5	6 10 57.45	19 19 30.7	13.72	5	8 18 48.17	17 42 1.
6	6 13 36.48	19 20 53.0	12.23	6	8 21 25.87	17 36 33.
7	6 16 15.66	19 22 6.7	10.83	7	8 24 3.38	17 30 58.
8	6 18 54.98	19 23 11.7	9.42	8	8 26 40.69	17 25 14.
9	6 21 34.44	19 24 8.2	7.97	9	8 29 17.78	17 19 23.
10	6 24 14.02	19 24 56.0	6.52	10	8 31 54.65	17 13 25.
11	6 26 53.72	19 25 35.1	5.07	11	8 34 31.31	17 7 19.
12	6 29 33.53	19 26 5.5	3.62	12	8 37 7.73	17 1 5.
13	6 32 13.45	19 26 27.2	2.15	13	8 39 43.92	16 54 45.
14	6 34 53.46	19 26 40.1	0.68	14	8 42 19.88	16 48 17.
15	6 37 33.56	19 26 44.2	0.77	15	8 44 55.60	16 41 42.
16	6 40 13.74	19 26 39.6	2.23	16	8 47 31.07	16 35 0.
17	6 42 54.00	19 26 26.2	3.70	17	8 50 6.29	16 28 10.
18	6 45 34.32	19 26 4.0	5.17	18	8 52 41.25	16 21 14.
19	6 48 14.70	19 25 33.0	6.63	19	8 55 15.96	16 14 11.
20	6 50 55.14	19 24 53.2	8.10	20	8 57 50.40	16 7 2.
21	6 53 35.62	19 24 4.6	9.57	21	9 0 24.57	15 59 45.
22	6 56 16.13	19 23 7.2	11.03	22	9 2 58.47	15 52 22.
23	6 58 56.67	N. 19 22 1.0	12.52	23	9 5 32.10	N. 15 44 52.
SATURDAY 26.				MONDAY 28.		
0	7 1 37.23	N. 19 20 45.9	13.98	0	9 8 5.45	N. 15 37 16.
1	7 4 17.80	19 19 22.0	15.43	1	9 10 38.52	15 29 34.
2	7 6 58.38	19 17 49.4	16.90	2	9 13 11.30	15 21 45.
3	7 9 38.96	19 16 8.0	18.38	3	9 15 43.79	15 13 51.
4	7 12 19.52	19 14 17.7	19.83	4	9 18 15.99	15 5 50.
5	7 15 0.06	19 12 18.7	21.28	5	9 20 47.90	14 57 43.
6	7 17 40.58	19 10 11.0	22.75	6	9 23 19.51	14 49 30.
7	7 20 21.06	19 7 54.5	24.20	7	9 25 50.82	14 41 11.
8	7 23 1.50	19 5 29.3	25.65	8	9 28 21.83	14 32 47.
9	7 25 41.89	19 2 55.4	27.08	9	9 30 52.53	14 24 17.
10	7 28 22.23	19 0 12.9	28.53	10	9 33 22.93	14 15 41.
11	7 31 2.50	18 57 21.7	29.98	11	9 35 53.02	14 7 0.
12	7 33 42.71	18 54 21.8	31.42	12	9 38 22.80	13 58 14.
13	7 36 22.83	18 51 13.3	32.83	13	9 40 52.27	13 49 22.
14	7 39 2.86	18 47 56.3	34.25	14	9 43 21.42	13 40 25.
15	7 41 42.80	18 44 30.8	35.68	15	9 45 50.25	13 31 23.
16	7 44 22.64	18 40 56.7	37.08	16	9 48 18.77	13 22 16.
17	7 47 2.37	18 37 14.2	38.48	17	9 50 46.97	13 13 4.
18	7 49 41.98	18 33 23.3	39.87	18	9 53 14.86	13 3 47.
19	7 52 21.47	18 29 24.1	41.27	19	9 55 42.42	12 54 25.
20	7 55 0.83	18 25 16.5	42.65	20	9 58 9.66	12 44 59.
21	7 57 40.06	18 21 0.6	44.02	21	10 0 36.58	12 35 29.
22	8 0 19.14	18 16 36.5	45.38	22	10 3 3.18	12 25 53.
23	8 2 58.07	18 12 4.2	46.73	23	10 5 29.45	12 16 14.
24	8 5 36.85	N. 18 7 23.8		24	10 7 55.40	N. 12 6 30.

## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 29.				THURSDAY 31.		
h m s	° ' "	"		h m s	° ' "	"
10 7 55.40	N. 12 6 30.6	97.98	0	11 58 36.05	N. 3 25 42.5	113.97
10 10 21.03	11 56 42.7	98.67	1	12 0 47.51	3 14 18.7	113.98
10 12 46.33	11 46 50.7	99.32	2	12 2 58.73	3 2 54.8	113.97
10 15 11.31	11 36 54.8	99.97	3	12 5 9.72	2 51 31.0	113.97
10 17 35.96	11 26 55.0	100.60	4	12 7 20.47	2 40 7.2	113.95
10 20 0.29	11 16 51.4	101.22	5	12 9 30.98	2 28 43.5	113.90
10 22 24.29	11 6 44.1	101.82	6	12 11 41.27	2 17 20.1	113.87
10 24 47.98	10 56 33.2	102.40	7	12 13 51.34	2 5 56.9	113.80
10 27 11.34	10 46 18.8	102.97	8	12 16 1.18	1 54 34.1	113.75
10 29 34.37	10 36 1.0	103.52	9	12 18 10.80	1 43 11.6	113.67
10 31 57.09	10 25 39.9	104.07	10	12 20 20.20	1 31 49.6	113.57
10 34 19.48	10 15 15.5	104.58	11	12 22 29.39	1 20 28.2	113.48
10 36 41.55	10 4 48.0	105.08	12	12 24 38.37	1 9 7.3	113.37
10 39 3.30	9 54 17.5	105.58	13	12 26 47.14	0 57 47.1	113.27
10 41 24.74	9 43 44.0	106.05	14	12 28 55.72	0 46 27.5	113.13
10 43 45.85	9 33 7.7	106.52	15	12 31 4.09	0 35 8.7	112.98
10 46 6.65	9 22 28.6	106.97	16	12 33 12.26	0 23 50.8	112.85
10 48 27.14	9 11 46.8	107.40	17	12 35 20.23	0 12 33.7	112.70
10 50 47.31	9 1 2.4	107.82	18	12 37 28.02	N. 0 1 17.5	112.52
10 53 7.17	8 50 15.5	108.22	19	12 39 35.61	S. 0 9 57.6	112.35
10 55 26.72	8 39 26.2	108.60	20	12 41 43.02	0 21 11.7	112.17
1 10 57 45.96	8 28 34.6	108.98	21	12 43 50.25	0 32 24.7	111.98
2 11 0 4.90	8 17 40.7	109.35	22	12 45 57.30	0 43 36.6	111.77
3 11 2 23.53	N. 8 6 44.6	109.68	23	12 48 4.17	S. 0 54 47.2	111.57
WEDNESDAY 30.				FRIDAY, FEB. 1.		
h m s	° ' "	"		h m s	° ' "	"
0 11 4 41.85	N. 7 55 46.5	110.02	0	12 50 10.87	S. 1 5 56.6	
1 11 6 59.87	7 44 46.4	110.33				
2 11 9 17.60	7 33 44.4	110.65				
3 11 11 35.02	7 22 40.5	110.93				
4 11 13 52.15	7 11 34.9	111.20				
5 11 16 8.98	7 0 27.7	111.47				
6 11 18 25.53	6 49 18.9	111.72				
7 11 20 41.78	6 38 8.6	111.95				
8 11 22 57.74	6 26 56.9	112.17				
9 11 25 13.42	6 15 43.9	112.37				
0 11 27 28.82	6 4 29.7	112.58				
1 11 29 43.93	5 53 14.2	112.75				
2 11 31 58.77	5 41 57.7	112.92				
3 11 34 13.33	5 30 40.2	113.08				
4 11 36 27.62	5 19 21.7	113.22				
5 11 38 41.64	5 8 2.4	113.33				
6 11 40 55.39	4 56 42.4	113.47				
7 11 43 8.87	4 45 21.6	113.58				
8 11 45 22.09	4 34 0.1	113.65				
9 11 47 35.05	4 22 38.2	113.75				
0 11 49 47.75	4 11 15.7	113.80				
1 11 52 0.20	3 59 52.9	113.88				
2 11 54 12.40	3 48 29.6	113.90				
3 11 56 24.35	3 37 6.2	113.95				
4 11 58 36.05	N. 3 25 42.5					

## PHASES OF THE MOON.

☾ Last Quarter - - 4 20 37.1  
 ● New Moon - - - 12 23 19.4  
 ☽ First Quarter - - 20 21 39.9  
 ○ Full Moon - - - 27 12 51.4

☾ Apogee - - - - - 11 20  
 ☾ Perigee - - - - - 26 16



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	P.L. of diff.
1	Aldebaran W.	74 6 49	2153	75 56 28	2168	77 45 43	2185	79 34 33	2202
	Mars W.	60 33 12	2119	62 23 42	2134	64 13 50	2149	66 3 35	2164
	Pollux W.	31 18 55	2371	33 3 11	2367	34 47 33	2366	36 31 57	2369
	Jupiter E.	31 17 23	2161	29 27 57	2178	27 38 57	2196	25 50 23	2213
	Spica $\pi$ E.	59 59 53	2189	58 11 9	2206	56 22 51	2225	54 35 0	2244
	Sun E.	139 2 18	2487	137 20 46	2502	135 39 36	2519	133 58 49	2535
2	Aldebaran W.	88 32 18	2291	90 18 31	2309	92 4 18	2327	93 49 38	2346
	Mars W.	75 6 15	2249	76 53 30	2266	78 40 19	2284	80 26 42	2303
	Pollux W.	45 12 9	2407	46 55 33	2419	48 38 41	2432	50 21 30	2446
	Spica $\pi$ E.	45 42 58	2346	43 58 5	2367	42 13 43	2390	40 29 54	2412
	Antares E.	91 36 48	2351	89 52 3	2370	88 7 45	2388	86 23 53	2407
	Sun E.	125 41 0	2627	124 2 43	2646	122 24 51	2666	120 47 26	2686
3	Mars W.	89 11 50	2396	90 55 30	2415	92 38 44	2434	94 21 30	2453
	Pollux W.	58 50 36	2521	60 31 20	2536	62 11 43	2553	63 51 43	2569
	Regulus W.	22 21 11	2440	24 3 49	2458	25 46 1	2477	27 27 47	2496
	Spica $\pi$ E.	31 59 24	2543	30 19 11	2572	28 39 38	2604	27 0 48	2638
	Antares E.	77 51 24	2504	76 10 16	2524	74 29 36	2543	72 49 23	2563
	Sun E.	112 46 54	2785	111 12 6	2805	109 37 45	2825	108 3 49	2845
4	Mars W.	102 48 43	2546	104 28 52	2565	106 8 35	2584	107 47 52	2602
	Pollux W.	72 6 4	2652	73 43 48	2668	75 21 11	2685	76 58 11	2702
	Regulus W.	35 50 10	2586	37 29 24	2604	39 8 13	2621	40 46 39	2638
	Antares E.	64 35 7	2663	62 57 37	2683	61 20 34	2702	59 43 57	2723
	Sun E.	100 20 32	2942	98 49 6	2961	97 18 5	2979	95 47 26	2998
5	Pollux W.	84 57 48	2781	86 32 41	2795	88 7 15	2811	89 41 28	2825
	Regulus W.	48 53 8	2720	50 29 21	2736	52 5 13	2750	53 40 46	2766
	Jupiter W.	23 36 58	2729	25 13 0	2744	26 48 42	2757	28 24 6	2772
	Antares E.	51 47 30	2822	50 13 31	2843	48 39 59	2863	47 6 53	2885
	Sun E.	88 19 54	3087	86 51 28	3104	85 23 23	3120	83 55 38	3136
6	Regulus W.	61 33 44	2835	63 7 26	2847	64 40 53	2860	66 14 3	2872
	Jupiter W.	36 16 30	2839	37 50 7	2851	39 23 29	2863	40 56 35	2875
	Antares E.	39 28 13	2995	37 57 54	3019	36 28 5	3044	34 58 47	3071
	Sun E.	76 41 32	3211	75 15 36	3225	73 49 56	3238	72 24 32	3251
7	Regulus W.	73 56 14	2927	75 27 59	2935	76 59 33	2945	78 30 54	2954
	Jupiter W.	48 38 28	2928	50 10 12	2938	51 41 43	2947	53 13 2	2956
	Spica $\pi$ W.	21 7 25	3131	22 34 57	3115	24 2 48	3104	25 30 52	3097
	Antares E.	27 41 20	3241	26 16 0	3287	24 51 33	3339	23 28 7	3400
	Sun E.	65 21 14	3311	63 57 15	3321	62 33 28	3332	61 9 54	3341
8	Regulus W.	86 5 1	2994	87 35 21	3001	89 5 33	3007	90 35 37	3013
	Jupiter W.	60 47 2	2994	62 17 22	3001	63 47 34	3007	65 17 38	3014
	Spica $\pi$ W.	32 52 46	3084	34 21 15	3083	35 49 45	3085	37 18 13	3086
	Sun E.	54 14 43	3386	52 52 10	3394	51 29 46	3401	50 7 30	3408
9	Jupiter W.	72 46 14	3038	74 15 40	3043	75 45 0	3046	77 14 16	3050
	Spica $\pi$ W.	44 40 11	3093	46 8 29	3095	47 36 45	3096	49 4 59	3098
	Sun E.	43 18 4	3438	41 56 30	3443	40 35 2	3448	39 13 40	3453
10	Jupiter W.	84 39 37	3064	86 8 31	3065	87 37 24	3066	89 6 15	3069



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>	
1	Aldebaran W.	81 22 58	2219	83 10 57	2236	84 58 31	2255	86 45 37	2272
	Mars W.	67 52 57	2181	69 41 54	2197	71 30 26	2214	73 18 33	2231
	Pollux W.	38 16 17	2373	40 0 31	2379	41 44 36	2387	43 28 29	2396
	Jupiter E.	24 2 14	2231	22 14 33	2249	20 27 18	2268	18 40 31	2288
	Spica $\pi$ E.	52 47 38	2263	51 0 44	2283	49 14 19	2302	47 28 23	2324
	SUN E.	132 18 25	2554	130 38 27	2572	128 58 53	2590	127 19 44	2608
2	Aldebaran W.	95 34 30	2364	97 18 56	2383	99 2 55	2402	100 46 27	2421
	Mars W.	82 12 37	2321	83 58 6	2339	85 43 8	2359	87 27 42	2377
	Pollux W.	52 4 0	2459	53 46 11	2474	55 28 0	2489	57 9 29	2505
	Spica $\pi$ E.	38 46 37	2437	37 3 55	2462	35 21 48	2487	33 40 17	2515
	Antares E.	84 40 29	2427	82 57 32	2446	81 15 2	2465	79 32 59	2484
	SUN E.	119 10 27	2705	117 33 54	2726	115 57 48	2745	114 22 8	2765
3	Mars W.	96 3 49	2472	97 45 42	2490	99 27 9	2509	101 8 9	2528
	Pollux W.	65 31 21	2585	67 10 36	2602	68 49 28	2619	70 27 57	2635
	Regulus W.	29 9 6	2514	30 50 0	2533	32 30 28	2550	34 10 32	2569
	Spica $\pi$ E.	25 22 45	2676	23 45 33	2717	22 9 16	2765	20 34 2	2818
	Antares E.	71 9 37	2583	69 30 19	2603	67 51 28	2623	66 13 4	2643
	SUN E.	106 30 19	2865	104 57 15	2884	103 24 36	2903	101 52 21	2923
4	Mars W.	109 26 45	2620	111 5 13	2638	112 43 16	2656	114 20 55	2673
	Pollux W.	78 34 49	2718	80 11 5	2733	81 47 1	2750	83 22 35	2766
	Regulus W.	42 24 42	2655	44 2 22	2672	45 39 39	2689	47 16 34	2705
	Antares E.	58 7 47	2742	56 32 3	2763	54 56 46	2782	53 21 54	2803
	SUN E.	94 17 11	3017	92 47 19	3035	91 17 49	3052	89 48 41	3069
5	Pollux W.	91 15 23	2841	92 48 58	2855	94 22 15	2869	95 55 14	2883
	Regulus W.	55 15 58	2780	56 50 52	2795	58 25 27	2808	59 59 44	2821
	Jupiter W.	29 59 11	2786	31 33 57	2800	33 8 25	2813	34 42 36	2826
	Antares E.	45 34 15	2905	44 2 3	2927	42 30 18	2949	40 59 1	2972
	SUN E.	82 28 12	3152	81 1 5	3167	79 34 16	3182	78 7 45	3197
6	Regulus W.	67 46 58	2884	69 19 38	2894	70 52 4	2906	72 24 15	2916
	Jupiter W.	42 29 26	2887	44 2 2	2898	45 34 24	2908	47 6 33	2919
	Antares E.	33 30 2	3100	32 1 53	3130	30 34 20	3164	29 7 28	3201
	SUN E.	70 59 23	3265	69 34 30	3277	68 9 51	3288	66 45 26	3300
7	Regulus W.	80 2 4	2963	81 33 3	2970	83 3 52	2979	84 34 31	2986
	Jupiter W.	54 44 10	2964	56 15 8	2972	57 45 56	2980	59 16 34	2988
	Spica $\pi$ W.	26 59 5	3091	28 27 25	3087	29 55 50	3086	31 24 17	3084
	Antares E.	22 5 50	3471	20 44 53	3555	19 25 29	3658	18 7 57	3785
	SUN E.	59 46 30	3351	58 23 18	3360	57 0 16	3370	55 37 25	3378
8	Regulus W.	92 5 33	3019	93 35 22	3025	95 5 4	3030	96 34 40	3035
	Jupiter W.	66 47 34	3018	68 17 24	3024	69 47 7	3030	71 16 43	3034
	Spica $\pi$ W.	38 46 40	3087	40 15 5	3038	41 43 29	3090	43 11 51	3092
	SUN E.	48 45 23	3414	47 23 22	3421	46 1 29	3427	44 39 43	3433
9	Jupiter W.	78 43 27	3052	80 12 35	3056	81 41 39	3059	83 10 39	3061
	Spica $\pi$ W.	50 33 11	3099	52 1 22	3101	53 29 31	3102	54 57 38	3103
	SUN E.	37 52 23	3457	36 31 11	3461	35 10 3	3465	33 49 0	3470
10	Jupiter W.	90 35 3	3069	92 3 51	3070	93 32 37	3071	95 1 22	3072



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	P.L. of diff.
10	Spica $\pi$ g W.	56 25 44	3105	57 53 48	3105	59 21 52	3105	60 49 55	3105
	SUN E.	32 28 2	3472	31 7 7	3477	29 46 17	3480	28 25 31	3483
15	SUN W.	22 3 17	3420	23 25 11	3410	24 47 16	3403	26 9 29	3394
	$\alpha$ Pegasi E.	38 28 41	3990	37 16 51	4055	36 6 6	4130	34 56 34	4216
	Saturn E.	45 42 27	3031	44 12 52	3027	42 43 13	3022	41 13 27	3017
	$\alpha$ Arietis E.	78 31 18	3160	77 4 21	3158	75 37 22	3154	74 10 18	3153
	Mars E.	121 9 23	3022	119 39 37	3015	118 9 43	3009	116 39 42	3004
16	SUN W.	33 2 52	3355	34 26 0	3348	35 49 16	3339	37 12 42	3331
	Saturn E.	33 43 0	2989	32 12 34	2983	30 42 0	2977	29 11 18	2970
	$\alpha$ Arietis E.	66 54 16	3141	65 26 56	3138	63 59 33	3138	62 32 9	3135
	Aldebaran E.	98 28 49	2962	96 57 48	2955	95 26 39	2948	93 55 21	2942
	Mars E.	109 7 47	2974	107 37 1	2967	106 6 7	2961	104 35 5	2954
17	SUN W.	44 12 17	3283	45 36 43	3279	47 1 19	3269	48 26 7	3259
	$\alpha$ Arietis E.	55 14 49	3134	53 47 20	3135	52 19 53	3138	50 52 29	3139
	Aldebaran E.	86 16 41	2905	84 44 28	2897	83 12 5	2888	81 39 31	2880
	Mars E.	96 57 43	2918	95 25 47	2910	93 53 41	2902	92 21 25	2894
18	SUN W.	55 33 3	3206	56 59 5	3196	58 25 19	3184	59 51 47	3172
	$\alpha$ Arietis E.	43 36 38	3169	42 9 52	3181	40 43 20	3194	39 17 3	3209
	Aldebaran E.	73 53 51	2833	72 20 6	2823	70 46 8	2813	69 11 57	2802
	Mars E.	84 37 28	2852	83 4 7	2842	81 30 34	2833	79 56 49	2823
19	SUN W.	67 7 50	3108	68 35 50	3095	70 4 6	3081	71 32 39	3067
	Fomalhaut W.	37 50 10	3554	39 9 35	3487	40 30 14	3426	41 52 1	3371
	Aldebaran E.	61 17 22	2744	59 41 41	2732	58 5 44	2720	56 29 30	2706
	Mars E.	72 4 50	2772	70 29 46	2761	68 54 27	2750	67 18 54	2740
	Pollux E.	105 13 19	2808	103 39 1	2795	102 4 27	2782	100 29 35	2768
20	SUN W.	78 59 50	2993	80 30 12	2977	82 0 54	2961	83 31 55	2945
	Fomalhaut W.	48 55 34	3143	50 22 52	3106	51 50 54	3069	53 19 41	3036
	$\alpha$ Pegasi W.	36 9 20	3688	37 26 20	3599	38 44 56	3516	40 5 3	3441
	Aldebaran E.	48 23 55	2638	46 45 52	2624	45 7 30	2610	43 28 48	2595
	Mars E.	59 17 27	2682	57 40 23	2672	56 3 5	2660	54 25 31	2648
	Pollux E.	92 30 44	2699	90 54 2	2684	89 17 1	2669	87 39 40	2655
21	SUN W.	91 12 14	2862	92 45 22	2845	94 18 52	2827	95 52 45	2810
	Fomalhaut W.	60 53 33	2886	62 26 10	2858	63 59 23	2832	65 33 9	2808
	$\alpha$ Pegasi W.	47 4 49	3145	48 32 4	3096	50 0 18	3052	51 29 26	3010
	Saturn W.	29 14 47	2547	30 54 55	2530	32 35 26	2514	34 16 20	2498
	Aldebaran E.	35 10 11	2518	33 29 23	2503	31 48 14	2487	30 6 42	2471
	Mars E.	46 13 50	2593	44 34 45	2583	42 55 27	2574	41 15 56	2565
	Pollux E.	79 27 58	2580	77 48 36	2566	76 8 54	2551	74 28 51	2535
22	SUN W.	103 47 52	2721	105 24 4	2704	107 0 38	2686	108 37 37	2669
	Fomalhaut W.	73 29 55	2692	75 6 46	2670	76 44 6	2649	78 21 54	2629
	$\alpha$ Pegasi W.	59 7 26	2830	60 41 15	2798	62 15 45	2769	63 50 53	2741
	Saturn W.	42 46 32	2415	44 29 45	2399	46 13 21	2382	47 57 21	2361
	Mars E.	32 55 47	2539	31 15 28	2539	29 35 9	2543	27 54 56	2551
	Pollux E.	66 3 24	2462	64 21 18	2448	62 38 51	2433	60 56 4	2411
23	SUN W.	116 48 24	2581	118 27 45	2565	120 7 28	2548	121 47 34	2531
	Saturn W.	56 43 13	2285	58 29 34	2269	60 16 19	2254	62 3 26	2231



MEAN TIME.											
LUNAR DISTANCES.											
Day of the Month.	Star's Name and Position.		Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.	
10	Spica $\pi$ W.	62 17 58	3107	63 45 59	3106	65 14 1	3107	66 42 2	3107		
	SUN E.	27 4 48	3487	25 44 9	3491	24 23 35	3495	23 3 5	3499		
15	SUN W.	27 31 52	3386	28 54 24	3379	30 17 4	3371	31 39 54	3364		
	$\alpha$ Pegasi E.	33 48 23	4312	32 41 41	4423	31 36 40	4549	30 33 31	4695		
	Saturn E.	39 43 35	3011	38 13 36	3006	36 43 31	3001	35 13 19	2995		
	$\alpha$ Arietis E.	72 43 12	3149	71 16 2	3148	69 48 50	3144	68 21 34	3143		
	Mars E.	115 9 34	2998	113 39 19	2992	112 8 56	2986	110 38 26	2979		
16	SUN W.	38 36 17	3323	40 0 2	3314	41 23 57	3306	42 48 2	3297		
	Saturn E.	27 40 28	2964	26 9 30	2957	24 38 24	2950	23 7 9	2943		
	$\alpha$ Arietis E.	61 4 42	3135	59 37 15	3134	58 9 46	3134	56 42 17	3134		
	Aldebaran E.	92 23 55	2935	90 52 20	2928	89 20 37	2920	87 48 43	2913		
	Mars E.	103 3 54	2947	101 32 35	2939	100 1 6	2933	98 29 29	2926		
17	SUN W.	49 51 6	3249	51 16 17	3239	52 41 40	3229	54 7 15	3218		
	$\alpha$ Arietis E.	49 25 7	3143	47 57 50	3148	46 30 38	3154	45 3 34	3161		
	Aldebaran E.	80 6 46	2871	78 33 50	2862	77 0 43	2852	75 27 23	2843		
	Mars E.	90 48 59	2887	89 16 23	2878	87 43 36	2870	86 10 38	2860		
18	SUN W.	61 18 30	3160	62 45 27	3147	64 12 40	3135	65 40 7	3122		
	$\alpha$ Arietis E.	37 51 5	3229	36 25 30	3252	35 0 22	3278	33 35 45	3312		
	Aldebaran E.	67 37 31	2791	66 2 52	2779	64 27 57	2769	62 52 48	2756		
	Mars E.	78 22 51	2814	76 48 41	2803	75 14 17	2793	73 39 41	2782		
19	SUN W.	73 1 29	3052	74 30 37	3038	76 0 2	3022	77 29 47	3008		
	Fomalhaut W.	43 14 51	3319	44 38 40	3271	46 3 26	3226	47 29 5	3183		
	Aldebaran E.	54 52 58	2694	53 16 10	2680	51 39 3	2666	50 1 38	2653		
	Mars E.	65 43 7	2728	64 7 4	2717	62 30 47	2706	60 54 15	2694		
	Pollux E.	98 54 25	2755	97 18 58	2741	95 43 12	2727	94 7 8	2712		
20	SUN W.	85 3 17	2928	86 35 0	2912	88 7 3	2895	89 39 28	2879		
	Fomalhaut W.	54 49 9	3004	56 19 17	2972	57 50 5	2942	59 21 31	2913		
	$\alpha$ Pegasi W.	41 26 33	3372	42 49 22	3308	44 13 24	3250	45 38 34	3195		
	Aldebaran E.	41 49 46	2580	40 10 24	2565	38 30 41	2550	36 50 37	2534		
	Mars E.	52 47 41	2637	51 9 36	2625	49 31 15	2615	47 52 40	2604		
21	Pollux E.	86 2 0	2641	84 24 0	2626	82 45 40	2610	81 6 59	2596		
	SUN W.	97 27 0	2792	99 1 39	2775	100 36 40	2757	102 12 5	2740		
	Fomalhaut W.	67 7 27	2782	68 42 18	2759	70 17 40	2735	71 53 33	2713		
	$\alpha$ Pegasi W.	52 59 27	2970	54 30 17	2932	56 1 55	2897	57 34 18	2862		
	Saturn W.	35 57 36	2482	37 39 15	2465	39 21 18	2449	41 3 43	2432		
22	Aldebaran E.	28 24 48	2454	26 42 30	2438	24 59 50	2422	23 16 47	2406		
	Mars E.	39 36 13	2557	37 56 19	2550	36 16 15	2545	34 36 4	2540		
	Pollux E.	72 48 27	2520	71 7 42	2506	69 26 37	2491	67 45 11	2476		
	SUN W.	110 14 59	2651	111 52 45	2633	113 30 55	2616	115 9 28	2599		
23	Fomalhaut W.	80 0 9	2610	81 38 50	2591	83 17 57	2573	84 57 29	2556		
	$\alpha$ Pegasi W.	65 26 40	2713	67 3 2	2687	68 40 0	2662	70 17 31	2638		
	Saturn W.	49 41 44	2350	51 26 31	2334	53 11 41	2317	54 57 16	2302		
	Mars E.	26 14 53	2562	24 35 6	2582	22 55 47	2611	21 17 7	2651		
	Pollux E.	59 12 57	2407	57 29 32	2394	55 45 49	2381	54 1 47	2370		
23	SUN W.	123 28 2	2516	125 8 53	2500	126 50 6	2485	128 31 40	2470		
	Saturn W.	63 50 55	2224	65 38 47	2209	67 27 1	2194	69 15 37	2181		



MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Star's Name and Position.		Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	P.L. of diff.
23	♈ Arietis	W.	28 48 23	2954	30 19 34	2867	31 52 35	2792	33 27 14	2726
	Pollux	E.	52 17 29	2358	50 32 54	2348	48 48 5	2338	47 3 1	2330
	Regulus	E.	87 40 0	2259	85 53 0	2244	84 5 38	2229	82 17 53	2213
	Jupiter	E.	112 34 36	2245	110 47 16	2229	108 59 32	2214	107 11 26	2198
24	SUN	W.	130 13 35	2455	131 55 51	2441	133 38 27	2428	135 21 22	2414
	Saturn	W.	71 4 33	2167	72 53 50	2153	74 43 28	2141	76 33 24	2128
	♈ Arietis	W.	41 39 44	2485	43 21 19	2448	45 3 46	2416	46 46 58	2386
	Pollux	E.	38 15 13	2309	36 29 26	2310	34 43 41	2315	32 58 4	2323
	Regulus	E.	73 13 34	2141	71 23 38	2128	69 33 22	2116	67 42 47	2103
	Jupiter	E.	98 5 18	2127	96 15 0	2113	94 24 21	2101	92 33 23	2088
25	Saturn	W.	85 47 38	2074	87 39 17	2064	89 31 11	2056	91 23 18	2048
	♈ Arietis	W.	55 32 45	2268	57 19 32	2249	59 6 46	2233	60 54 25	2218
	Aldebaran	W.	21 43 29	2050	23 35 46	2040	25 28 18	2031	27 21 4	2023
	Regulus	E.	58 25 19	2049	56 33 1	2039	54 40 28	2031	52 47 42	2023
	Jupiter	E.	83 14 0	2034	81 21 18	2024	79 28 21	2015	77 35 11	2008
26	Saturn	W.	100 46 37	2019	102 39 42	2015	104 32 53	2012	106 26 9	2009
	♈ Arietis	W.	69 57 39	2162	71 47 4	2154	73 36 41	2148	75 26 27	2143
	Aldebaran	W.	36 47 38	1993	38 41 23	1989	40 35 14	1987	42 29 9	1984
	Mars	W.	27 23 40	2200	29 12 8	2175	31 1 14	2153	32 50 53	2126
	Regulus	E.	43 21 6	1993	41 27 21	1989	39 33 30	1986	37 39 34	1984
27	Jupiter	E.	68 6 33	1977	66 12 23	1973	64 18 7	1970	62 23 46	1968
	Aldebaran	W.	51 59 16	1984	53 53 15	1987	55 47 10	1990	57 41 0	1994
	Mars	W.	42 4 9	2090	43 55 24	2086	45 46 45	2084	47 38 8	2084
	Regulus	E.	28 9 26	1984	26 15 27	1987	24 21 32	1989	22 27 41	1994
	Jupiter	E.	52 51 31	1969	50 57 7	1970	49 2 46	1974	47 8 30	1978
28	Spica ♏	E.	81 58 30	2013	80 5 16	2016	78 12 6	2020	76 19 3	2024
	Aldebaran	W.	67 8 13	2025	69 1 8	2034	70 53 49	2043	72 46 16	2053
	Mars	W.	56 54 31	2101	58 45 29	2107	60 36 17	2115	62 26 53	2124
	Pollux	W.	24 45 57	2366	26 30 20	2333	28 15 32	2308	30 1 20	2289
	Jupiter	E.	37 39 9	2009	35 45 49	2018	33 52 42	2027	31 59 50	2037
29	Spica ♏	E.	66 55 55	2059	65 3 52	2069	63 12 5	2079	61 20 33	2090
	Aldebaran	W.	82 4 23	2113	83 55 3	2126	85 45 23	2140	87 35 21	2156
	Mars	W.	71 36 13	2179	73 25 13	2192	75 13 53	2206	77 2 12	2220
	Pollux	W.	38 54 49	2261	40 41 46	2264	42 28 38	2269	44 15 23	2275
	Spica ♏	E.	52 7 38	2159	50 18 9	2175	48 29 3	2192	46 40 23	2211
30	Antares	E.	98 0 21	2175	96 11 16	2188	94 22 31	2202	92 34 7	2217
	Mars	W.	85 58 7	2301	87 44 5	2319	89 29 37	2337	91 14 43	2355
	Pollux	W.	53 6 4	2327	54 51 24	2341	56 36 24	2355	58 21 4	2369
	Regulus	W.	16 30 46	2235	18 18 21	2252	20 5 31	2270	21 52 15	2288
	Spica ♏	E.	37 44 14	2315	35 58 36	2339	34 13 33	2364	32 29 7	2392
31	Antares	E.	83 37 49	2298	81 51 47	2316	80 6 11	2335	78 21 2	2350
	Mars	W.	99 53 23	2452	101 35 44	2472	103 17 37	2492	104 59 1	2512
	Pollux	W.	66 58 52	2450	68 41 15	2468	70 23 13	2486	72 4 46	2504
	Regulus	W.	30 39 14	2380	32 23 17	2400	34 6 52	2419	35 50 0	2438
	Antares	E.	69 42 11	2453	67 59 51	2473	66 18 0	2494	64 36 38	2512
	SUN	E.	132 56 29	2711	131 20 4	2731	129 44 6	2752	128 8 35	2772



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>b</sup> .	P. L. of diff.	XVIII <sup>b</sup> .	P. L. of diff.	XXI <sup>b</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
23	α Arietis W.	35 3 20	2666	36 40 45	2614	38 19 21	2567	39 59 2	2522
	Pollux E.	45 17 45	2322	43 32 18	2316	41 46 42	2312	40 1 0	2309
	Regulus E.	80 29 45	2198	78 41 15	2183	76 52 22	2170	75 3 9	2155
	Jupiter E.	105 22 56	2184	103 34 5	2169	101 44 51	2155	99 55 15	2141
24	SUN W.	137 4 36	2401	138 48 9	2390	140 31 58	2378	142 16 4	2368
	Saturn W.	78 23 40	2116	80 14 14	2105	82 5 5	2094	83 56 14	2084
	α Arietis W.	48 30 53	2357	50 15 29	2333	52 0 41	2309	53 46 27	2287
	Pollux E.	31 12 38	2336	29 27 31	2355	27 42 51	2380	25 58 48	2414
	Regulus E.	65 51 53	2091	64 0 40	2079	62 9 9	2069	60 17 22	2059
	Jupiter E.	90 42 6	2076	88 50 30	2065	86 58 37	2052	85 6 26	2044
25	Saturn W.	93 15 37	2041	95 8 7	2034	97 0 48	2028	98 53 39	2023
	α Arietis W.	62 42 26	2204	64 30 48	2191	66 19 29	2180	68 8 27	2171
	Aldebaran W.	29 14 2	2016	31 7 11	2009	33 0 31	2003	34 54 1	1998
	Regulus E.	50 54 44	2016	49 1 34	2009	47 8 13	2003	45 14 44	1998
	Jupiter E.	75 41 49	2000	73 48 14	1994	71 54 30	1987	70 0 35	1982
26	Saturn W.	108 19 29	2008	110 12 50	2007	112 6 13	2008	113 59 35	2009
	α Arietis W.	77 16 20	2189	79 6 20	2137	80 56 23	2135	82 46 29	2134
	Aldebaran W.	44 23 8	1982	46 17 10	1982	48 11 13	1982	50 5 15	1983
	Mars W.	34 40 57	2122	36 31 23	2111	38 22 5	2102	40 13 2	2095
	Regulus E.	35 45 35	1982	33 51 33	1982	31 57 30	1982	30 3 27	1983
	Jupiter E.	60 29 22	1967	58 34 55	1966	56 40 27	1965	54 45 58	1967
27	Aldebaran W.	59 34 44	1999	61 28 20	2004	63 21 48	2010	65 15 6	2017
	Mars W.	49 29 31	2085	51 20 53	2087	53 12 12	2091	55 3 25	2096
	Regulus E.	20 33 58	1998	18 40 21	2004	16 46 53	2011	14 53 36	2018
	Jupiter E.	45 14 21	1982	43 20 18	1988	41 26 25	1994	39 32 41	2001
	Spica η E.	74 26 6	2030	72 33 18	2035	70 40 39	2042	68 48 10	2051
28	Aldebaran W.	74 38 28	2063	76 30 24	2075	78 22 2	2087	80 13 22	2099
	Mars W.	64 17 15	2132	66 7 25	2143	67 57 18	2154	69 46 55	2167
	Pollux W.	31 47 35	2276	33 34 10	2268	35 20 57	2262	37 7 52	2261
	Jupiter E.	30 7 13	2048	28 14 53	2060	26 22 52	2072	24 31 9	2085
	Spica η E.	59 29 19	2102	57 38 23	2115	55 47 47	2129	53 57 32	2143
29	Aldebaran W.	89 24 57	2170	91 14 10	2186	93 2 59	2202	94 51 24	2218
	Mars W.	78 50 10	2235	80 37 45	2251	82 24 56	2267	84 11 44	2284
	Pollux W.	46 1 59	2284	47 48 22	2293	49 34 32	2304	51 20 26	2315
	Spica η E.	44 52 11	2229	43 4 26	2249	41 17 11	2269	39 30 26	2292
	Antares E.	90 46 5	2232	88 58 25	2248	87 11 9	2264	85 24 17	2281
30	Mars W.	92 59 22	2374	94 43 34	2394	96 27 18	2412	98 10 35	2433
	Pollux W.	60 5 23	2385	61 49 20	2401	63 32 54	2417	65 16 5	2434
	Regulus W.	23 38 32	2306	25 24 23	2324	27 9 47	2343	28 54 44	2362
	Spica η E.	30 45 21	2422	29 2 18	2453	27 19 59	2489	25 38 30	2528
	Antares E.	76 36 20	2372	74 52 5	2392	73 8 19	2412	71 25 1	2431
31	Mars W.	106 39 56	2533	108 20 23	2554	110 0 21	2575	111 39 50	2596
	Pollux W.	73 45 55	2522	75 26 38	2540	77 6 56	2559	78 46 48	2577
	Regulus W.	37 32 41	2458	39 14 54	2476	40 56 41	2495	42 38 1	2515
	Antares E.	62 55 47	2537	61 15 25	2559	59 35 34	2581	57 56 13	2604
	SUN E.	126 33 31	2793	124 58 54	2814	123 24 44	2835	121 51 1	2855

## CONFIGURATIONS OF THE SATELLITES OF JUPITER,

At 15<sup>h</sup> 30<sup>m</sup>, MEAN TIME.

Day of the Month.	<i>West.</i>		<i>East.</i>	
1		3. .2	○ .4 1'	
2		.3 .1	○ .2 .4	
3			○ .3 1. 2. .4	
4	.1 ●	2.	○ .3 .4	
5		.2 1. ○	3' .4'	
6			○ .1 .2 .3 .4	
7		1. .3	○ 2. .4	
8		3. 2.	○ 1' .4'	
9		.3 .1	○ .4 .2	
10	.3 ●	4.	○ 1. 2.	
11		4. 2. .1	○ .3	
12		4. .2	○ 3' .1.	
13	4.		○ .1 .2 3.	
14	.4	1. 3.	○ 2.	
15	.4	3. 2.	○ .1	
16		.4 .1	○ .2	
17		.4 .1	○ 1. 2'	
18		.1 .2	○ .4 .3	
19		.2	○ 1. .3 .4	
20	.1 ●		○ .2 3. .4	
21	3. ○	1.	○ 2. .4	
22		3. 2.	○ .1 .4	
23		.3 1. .2	○ .4	
24		.3	○ 1' 2' .4	
25	2. ○	.1	○ .3 .4	
26		.2 .4	○ 1. .3	
27	.1 ●	4.	○ .2 3.	
28		4. 1. .3	○ 2.	
29		4. 3. 2.	○ .1	
30	.4	.3 1. .2	○	
31	.4	.3	○ 1' .2	

This Table represents, at 15<sup>h</sup> 30<sup>m</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the page; the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of the Satellites' motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite placed by the side of it is *on the disc of Jupiter*, and a black circle (●) that it is either *behind the disc*, or in the *shadow of Jupiter*.



## ECLIPSES OF THE SATELLITES OF JUPITER.

SATELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.	1	<sup>h</sup> <sup>m</sup> <sup>s</sup> 1 9 23.1	<sup>h</sup> <sup>m</sup> <sup>s</sup> 19 52 41.9	Im.
	2†	19 37 38.2	14 27 55.6	Im.
	4*	14 5 56.8	9 3 12.8	Im.
	6	8 34 12.7	3 38 27.3	Im.
	8	3 2 33.4	22 13 46.6	Im.
	9	21 30 49.1	16 49 0.9	Im.
	11*	15 59 7.8	11 24 18.3	Im.
	13†	10 27 23.9	5 59 33.0	Im.
	15	4 55 44.8	0 34 52.6	Im.
	16	23 24 1.0	19 10 7.4	Im.
	18*	17 52 19.9	13 45 24.9	Im.
	20*	12 20 36.5	8 20 40.2	Im.
	22	6 48 57.8	2 56 0.1	Im.
	24	1 17 14.9	21 31 15.7	Im.
	25†	19 45 34.3	16 6 33.8	Im.
	27*	14 13 51.9	10 41 50.0	Im.
	29†	8 42 13.8	5 17 10.5	Im.
	31	3 10 32.1	23 52 27.5	Im.
II.	2	10 8 32.2	4 57 16.1	Im.
	5	23 25 31.9	18 28 16.4	Im.
	9*	12 43 9.7	7 59 54.8	Im.
	13	2 0 13.0	21 30 58.8	Im.
	16*	15 17 58.8	11 2 45.4	Im.
	20	4 35 6.4	0 33 53.5	Im.
	23*	17 53 0.7	14 5 48.6	Im.
	27	7 10 12.8	3 37 1.3	Im.
	30	20 28 15.4	17 9 4.7	Im.
III.	3†	11 7 20.6	6 0 10.7	Im.
	3*	14 26 50.4	9 20 13.3	Em.
	10*	15 5 1.8	10 26 6.9	Im.
	10*	18 23 55.4	13 45 33.1	Em.
	17*	19 2 19.6	14 51 39.5	Im.
	17	22 20 36.3	18 10 28.8	Em.
	24	22 59 39.5	19 17 14.3	Im.
	25	2 17 18.8	22 35 26.1	Em.
IV.	0	22 13 28.8	16 56 18.7	Im. i e
	1	2 9 57.7	20 53 26.4	Em. * *
	17*	16 11 47.3	12 0 39.2	Im.
	17	20 2 38.0	15 52 7.8	Em.



APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHADOWS.	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Egress.
	d h m	d h m	d h m	d h m	d h m	d h m
I.		1 23 19	1 18 13	2 20 30	1 17 2	2 19 2
		2 17 54	3* 12 47	3 15 5	3* 11 37	3* 13 5
		4* 12 28	5* 7 22	5* 9 39	5* 6 12	5* 8 3
		6* 7 3	7 1 56	7 4 14	7 0 48	7 3
		8 1 37	9 20 30	9 22 48	9 19 23	9 21 4
		10 20 11	10† 15 4	10 17 22	10* 13 58	10 16 1
	In	11† 14 45	12* 9 39	12* 11 56	12* 8 34	12* 10 5
		13* 9 19	14 4 13	14* 6 30	14 3 9	14† 5 2
		15 3 53	16 22 47	16 1 4	16 21 44	16 0
	the	17 22 27	17 17 21	17 19 38	17 16 20	17 18 3
		18 17 1	19* 11 55	19* 14 12	19* 10 55	19* 13 1
		20* 11 35	21* 6 29	21* 8 46	21† 5 30	21* 7 4
	Shadow.	22* 6 9	23 1 3	23 3 20	23 0 6	23 2 2
		24 0 42	24 19 36	25 21 54	24 18 41	25 21
		25 19 16	26* 14 10	26 16 27	26* 13 16	26† 15 3
		27* 13 49	28* 8 44	28* 11 1	28* 7 52	28* 10 1
		29* 8 23	30 3 17	30† 5 34	30 2 27	30 4 4
		31 2 56				
II.		2* 10 7	4 2 30	4† 5 18	4 0 9	4 3
		6 23 34	7 15 57	7 18 45	7* 13 40	7 16 3
	In	9* 13 2	11† 5 25	11* 8 13	11 3 11	11† 6
		13 2 28	14 18 50	15 21 38	14 16 41	14 19 3
	the	16 15 55	18* 8 16	18* 11 3	18* 6 12	18* 9
		20† 5 20	22 21 41	22 0 28	21 19 43	22 22 3
	Shadow.	23 18 46	25* 11 5	25* 13 52	25* 9 14	25* 12
		27* 8 10	29 0 29	29 3 16	29 22 44	29 1 3
III.		3* 10 42	3* 14 1	7 0 34	7 3 52	7 19 54
		10† 14 53	10 18 10	14 4 42	14* 7 59	14 0 20
		17 18 58	18 22 14	21* 8 46	21* 12 2	21 4 47
		25 22 58	25 2 14	28* 12 45	28† 16 0	28* 9 13
IV.		1 4 22	1* 7 41	9* 11 19	9† 14 31	9 0 32
		18 21 55	18 1 0	26 4 23	26* 7 2	26 23 4

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>h</sup> 871790.  Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	-0.5650	+1.3016	-9.2656	+0.9148	<sup>h</sup> 5 <sup>m</sup> 16 <sup>s</sup> 0.71	284	0	.000
2	0.6019	1.2999	9.2578	0.9141	5 12 4.80	285	1	.003
3	0.6359	1.2982	9.2499	0.9134	5 8 8.89	286	2	.005
4	-0.6672	+1.2963	-9.2419	+0.9127	5 4 12.98	287	3	.008
5	0.6963	1.2942	9.2337	0.9119	5 0 17.07	288	4	.011
6	0.7234	1.2920	9.2255	0.9111	4 56 21.16	289	5	.014
7	-0.7489	+1.2897	-9.2171	+0.9102	4 52 25.25	290	6	.016
8	0.7727	1.2872	9.2086	0.9094	4 48 29.34	291	7	.019
9	0.7952	1.2845	9.1999	0.9085	4 44 33.43	292	8	.022
10	-0.8165	+1.2817	-9.1912	+0.9075	4 40 37.52	293	9	.025
11	0.8366	1.2788	9.1824	0.9066	4 36 41.61	294	10	.027
12	0.8558	1.2756	9.1734	0.9056	4 32 45.69	295	11	.030
13	-0.8739	+1.2724	-9.1643	+0.9045	4 28 49.78	296	12	.033
14	0.8912	1.2689	9.1551	0.9035	4 24 53.87	297	13	.036
15	0.9078	1.2653	9.1457	0.9024	4 20 57.96	298	14	.038
16	-0.9235	+1.2615	-9.1362	+0.9013	4 17 2.05	299	15	.041
17	0.9386	1.2576	9.1266	0.9002	4 13 6.14	300	16	.044
18	0.9531	1.2535	9.1169	0.8990	4 9 10.23	301	17	.047
19	-0.9669	+1.2492	-9.1070	+0.8978	4 5 14.32	302	18	.049
20	0.9802	1.2447	9.0971	0.8966	4 1 18.41	303	19	.052
21	0.9929	1.2400	9.0870	0.8954	3 57 22.50	304	20	.055
22	-1.0052	+1.2351	-9.0767	+0.8942	3 53 26.59	305	21	.058
23	1.0169	1.2301	9.0662	0.8929	3 49 30.68	306	22	.060
24	1.0283	1.2249	9.0556	0.8916	3 45 34.77	307	23	.063
25	-1.0392	+1.2194	-9.0449	+0.8903	3 41 38.86	308	24	.066
26	1.0497	1.2138	9.0340	0.8890	3 37 42.95	309	25	.068
27	1.0598	1.2079	9.0230	0.8877	3 33 47.04	310	26	.071
28	-1.0695	+1.2019	-9.0118	+0.8863	3 29 51.14	311	27	.074
29	1.0789	1.1956	9.0005	0.8850	3 25 55.23	312	28	.077
30	1.0880	1.1890	8.9890	0.8836	3 21 59.32	313	29	.079
31	1.0967	1.1823	8.9773	0.8822	3 18 3.41	314	30	.082
32	-1.1052	+1.1753	-8.9654	+0.8808	3 14 7.50	315	31	.085



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Frid.	1	20 59 16.64	10.167	S. 17 6 27.7	43.06	1 8.20	13 53.74	0.310
Sat.	2	21 3 20.65	10.134	16 49 14.3	43.79	1 8.08	14 1.18	0.277
Sun.	3	21 7 23.86	10.100	16 31 43.3	44.51	1 7.96	14 7.82	0.243
Mon.	4	21 11 26.27	10.067	16 13 55.1	45.21	1 7.84	14 13.66	0.210
Tues.	5	21 15 27.88	10.034	15 55 50.0	45.90	1 7.72	14 18.70	0.177
Wed.	6	21 19 28.69	10.001	15 37 28.5	46.56	1 7.61	14 22.95	0.144
Thur.	7	21 23 28.71	9.968	15 18 51.0	47.21	1 7.49	14 26.40	0.111
Frid.	8	21 27 27.94	9.935	14 59 57.9	47.84	1 7.38	14 29.07	0.079
Sat.	9	21 31 26.39	9.903	14 40 49.6	48.45	1 7.27	14 30.96	0.046
Sun.	10	21 35 24.05	9.870	14 21 26.7	49.05	1 7.16	14 32.06	0.014
Mon.	11	21 39 20.94	9.838	14 1 49.4	49.64	1 7.05	14 32.40	0.018
Tues.	12	21 43 17.06	9.806	13 41 58.1	50.19	1 6.94	14 31.97	0.050
Wed.	13	21 47 12.41	9.775	13 21 53.5	50.73	1 6.83	14 30.77	0.082
Thur.	14	21 51 7.01	9.743	13 1 35.9	51.26	1 6.73	14 28.81	0.113
Frid.	15	21 55 0.85	9.712	12 41 5.6	51.77	1 6.62	14 26.11	0.143
Sat.	16	21 58 53.95	9.682	12 20 23.2	52.26	1 6.52	14 22.67	0.174
Sun.	17	22 2 46.31	9.652	11 59 29.0	52.73	1 6.42	14 18.49	0.205
Mon.	18	22 6 37.95	9.622	11 38 23.6	53.18	1 6.32	14 13.58	0.234
Tues.	19	22 10 28.88	9.593	11 17 7.3	53.62	1 6.22	14 7.97	0.263
Wed.	20	22 14 19.11	9.565	10 55 40.5	54.03	1 6.13	14 1.67	0.291
Thur.	21	22 18 8.66	9.537	10 34 3.7	54.44	1 6.03	13 54.68	0.318
Frid.	22	22 21 57.55	9.510	10 12 17.2	54.83	1 5.94	13 47.04	0.345
Sat.	23	22 25 45.79	9.484	9 50 21.4	55.19	1 5.85	13 38.76	0.372
Sun.	24	22 29 33.41	9.458	9 28 16.8	55.55	1 5.76	13 29.84	0.397
Mon.	25	22 33 20.41	9.434	9 6 3.7	55.88	1 5.67	13 20.32	0.421
Tues.	26	22 37 6.82	9.411	8 43 42.6	56.20	1 5.59	13 10.21	0.445
Wed.	27	22 40 52.68	9.388	8 21 13.7	56.51	1 5.51	12 59.53	0.467
Thur.	28	22 44 37.99	9.366	7 58 37.5	56.80	1 5.43	12 48.32	0.488
Frid.	29	22 48 22.78		S. 7 35 54.4		1 5.35	12 36.60	

\* Mean Time of the Semidiameter passing may be found by subtracting 0.18

## AT MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S			Equation of Time, to be subtracted from Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
Frid.	1	20 59 14.28	S. 17 6 37.7	16 14.8	13 53.67	20 45 20.61
Sat.	2	21 3 18.28	16 49 24.6	16 14.7	14 1.11	20 49 17.17
Sun.	3	21 7 21.49	16 31 53.8	16 14.5	14 7.76	20 53 13.72
Mon.	4	21 11 23.89	16 14 5.8	16 14.4	14 13.61	20 57 10.28
Tues.	5	21 15 25.49	15 56 0.9	16 14.2	14 18.66	21 1 6.83
Wed.	6	21 19 26.30	15 37 39.6	16 14.0	14 22.91	21 5 3.39
Thur.	7	21 23 26.31	15 19 2.3	16 13.8	14 26.37	21 8 59.94
Frid.	8	21 27 25.54	15 0 9.4	16 13.6	14 29.05	21 12 56.49
Sat.	9	21 31 23.99	14 41 1.3	16 13.5	14 30.95	21 16 53.05
Sun.	10	21 35 21.66	14 21 38.5	16 13.3	14 32.06	21 20 49.60
Mon.	11	21 39 18.56	14 2 1.4	16 13.1	14 32.40	21 24 46.16
Tues.	12	21 43 14.69	13 42 10.3	16 12.9	14 31.98	21 28 42.71
Wed.	13	21 47 10.05	13 22 5.8	16 12.7	14 30.79	21 32 39.26
Thur.	14	21 51 4.65	13 1 48.2	16 12.5	14 28.84	21 36 35.82
Frid.	15	21 54 58.51	12 41 18.1	16 12.3	14 26.14	21 40 32.37
Sat.	16	21 58 51.63	12 20 35.7	16 12.1	14 22.71	21 44 28.92
Sun.	17	22 2 44.01	11 59 41.6	16 11.9	14 18.54	21 48 25.48
Mon.	18	22 6 35.67	11 38 36.2	16 11.7	14 13.64	21 52 22.03
Tues.	19	22 10 26.62	11 17 19.9	16 11.5	14 8.04	21 56 18.58
Wed.	20	22 14 16.87	10 55 53.2	16 11.3	14 1.74	22 0 15.14
Thur.	21	22 18 6.45	10 34 16.3	16 11.0	13 54.76	22 4 11.69
Frid.	22	22 21 55.37	10 12 29.7	16 10.8	13 47.12	22 8 8.24
Sat.	23	22 25 43.64	9 50 33.9	16 10.6	13 38.84	22 12 4.80
Sun.	24	22 29 31.28	9 28 29.3	16 10.4	13 29.93	22 16 1.35
Mon.	25	22 33 18.31	9 6 16.1	16 10.1	13 20.41	22 19 57.90
Tues.	26	22 37 4.76	8 43 54.9	16 9.9	13 10.30	22 23 54.45
Wed.	27	22 40 50.64	8 21 26.0	16 9.7	12 59.63	22 27 51.01
Thur.	28	22 44 35.99	7 58 49.7	16 9.4	12 48.43	22 31 47.56
Frid.	29	22 48 20.82	S. 7 36 6.4	16 9.2	12 36.71	22 35 44.11

\* for Apparent Noon may be assumed the same as that for Mean Noon.



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Para	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Mid
1	312 20 32 '5	N.0 '48	9 '9937507	15 43 '2	15 35 '4	57 41 '4	57
2	313 21 22 '4	0 '58	9 '9938214	15 27 '8	15 20 '7	56 44 '9	56
3	314 22 11 '6	0 '65	9 '9938943	15 14 '0	15 8 '0	55 54 '3	55
4	315 22 59 '8	0 '69	9 '9939692	15 2 '6	14 57 '8	55 12 '2	54
5	316 23 47 '0	0 '70	9 '9940458	14 53 '7	14 50 '2	54 39 '6	54
6	317 24 33 '3	0 '69	9 '9941241	14 47 '4	14 45 '3	54 16 '4	54
7	318 25 18 '5	0 '64	9 '9942039	14 43 '8	14 42 '8	54 3 '2	53
8	319 26 2 '6	0 '56	9 '9942852	14 42 '4	14 42 '5	53 58 '1	53
9	320 26 45 '7	0 '46	9 '9943677	14 43 '1	14 44 '1	54 0 '6	54
10	321 27 27 '4	0 '35	9 '9944513	14 45 '5	14 47 '2	54 9 '4	54
11	322 28 7 '9	0 '22	9 '9945360	14 49 '3	14 51 '6	54 23 '4	54
12	323 28 47 '1	N.0 '09	9 '9946217	14 54 '3	14 57 '2	54 41 '7	54
13	324 29 24 '6	S.0 '04	9 '9947085	15 0 '3	15 3 '6	55 3 '8	55
14	325 30 0 '6	0 '16	9 '9947964	15 7 '2	15 11 '0	55 29 '1	55
15	326 30 35 '0	0 '27	9 '9948852	15 15 '0	15 19 '1	55 57 '7	56
16	327 31 7 '7	0 '35	9 '9949751	15 23 '5	15 28 '1	56 29 '0	56
17	328 31 38 '6	0 '41	9 '9950662	15 33 '0	15 38 '0	57 3 '7	57
18	329 32 7 '5	0 '44	9 '9951586	15 43 '1	15 48 '4	57 41 '0	58
19	330 32 34 '6	0 '44	9 '9952523	15 53 '8	15 59 '2	58 20 '1	58
20	331 32 59 '7	0 '41	9 '9953475	16 4 '4	16 9 '6	58 59 '2	59
21	332 33 22 '9	0 '35	9 '9954441	16 14 '4	16 18 '8	59 35 '7	59
22	333 33 44 '3	0 '27	9 '9955424	16 22 '6	16 25 '7	60 5 '8	60
23	334 34 3 '7	0 '16	9 '9956423	16 28 '1	16 29 '5	60 26 '0	60
24	335 34 21 '2	S.0 '03	9 '9957440	16 30 '0	16 29 '3	60 32 '9	60
25	336 34 36 '8	N.0 '10	9 '9958474	16 27 '7	16 25 '0	60 24 '6	60
26	337 34 50 '5	0 '23	9 '9959527	16 21 '2	16 16 '6	60 0 '8	59
27	338 35 2 '5	0 '36	9 '9960598	16 11 '2	16 5 '1	59 24 '0	59
28	339 35 12 '8	0 '47	9 '9961686	15 58 '4	15 51 '5	58 37 '2	58
29	340 35 21 '5	N.0 '57	9 '9962791	15 44 '3	15 37 '1	57 45 '3	57

## MEAN TIME.

		THE MOON'S					
Day of the Week.	Day of the Month.	Longitude.		Latitude.		Age.	Meridian
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.
Frid.	1	191° 58' 1" 9	198° 37' 33" 3	N. 3° 56' 52" 7	N. 4° 19' 45" 0	19° 0'	16 36' 8"
Sat.	2	205 10 39' 7	211 37 42' 1	4 38 50' 1	4 54 4' 5	20° 0'	17 23' 6"
Sun.	3	217 59 6' 8	224 15 22' 7	5 5 27' 5	5 13 1' 4	21° 0'	18 9' 7"
Mon.	4	230 27 1' 0	236 34 34' 8	5 16 50' 5	5 16 59' 7	22° 0'	18 55' 9"
Tues.	5	242 38 38' 0	248 39 44' 1	5 13 35' 9	5 6 46' 4	23° 0'	19 42' 5"
Wed.	6	254 38 26' 2	260 35 15' 9	4 56 39' 3	4 43 23' 8	24° 0'	20 29' 6"
Thur.	7	266 30 44' 1	272 25 20' 4	4 27 9' 3	4 8 6' 1	25° 0'	21 17' 1"
Frid.	8	278 19 31' 7	284 13 43' 4	3 46 25' 7	3 22 20' 2	26° 0'	22 4' 7"
Sat.	9	290 8 19' 3	296 3 41' 0	2 56 2' 8	2 27 48' 0	27° 0'	22 52' 2"
Sun.	10	302 0 8' 0	307 57 57' 3	1 57 51' 7	1 26 30' 7	28° 0'	23 39' 2"
Mon.	11	313 57 25' 2	319 58 46' 0	N. 0° 54' 3" 5	N. 0° 20' 50" 1	29° 0'	0 6' 5"
Tues.	12	326 2 12' 6	332 7 56' 9	S. 0° 12' 49" 5	S. 0° 46' 32" 8	0° 2'	0 25' 5"
Wed.	13	338 16 9' 8	344 27 1' 8	1 19 57' 7	1 52 40' 2	1° 2'	1 11' 2"
Thur.	14	350 40 43' 2	356 57 23' 8	2 24 17' 1	2 54 24' 4	2° 2'	1 56' 5"
Frid.	15	3 17 14' 1	9 40 24' 1	3 22 38' 3	3 48 35' 5	3° 2'	2 41' 9"
Sat.	16	16 7 4' 4	22 37 25' 4	4 11 53' 5	4 32 10' 1	4° 2'	3 27' 9"
Sun.	17	29 11 37' 4	35 49 50' 3	4 49 5' 1	5 2 19' 4	5° 2'	4 15' 3"
Mon.	18	42 32 13' 0	49 18 52' 4	5 11 35' 6	5 16 38' 7	6° 2'	5 4' 7"
Tues.	19	56 9 53' 9	63 5 19' 4	5 17 16' 9	5 13 20' 7	7° 2'	5 56' 9"
Wed.	20	70 5 7' 6	77 9 12' 5	5 4 44' 6	4 51 28' 1	8° 2'	6 52' 2"
Thur.	21	84 17 23' 2	91 29 22' 9	4 33 34' 9	4 11 14' 4	9° 2'	7 50' 2"
Frid.	22	98 44 48' 7	106 3 11' 7	3 44 42' 3	3 14 20' 6	10° 2'	8 50' 3"
Sat.	23	113 23 56' 1	120 46 20' 7	2 40 36' 7	2 4 5' 3	11° 2'	9 50' 8"
Sun.	24	128 9 39' 0	135 33 0' 6	1 25 24' 9	S. 0° 45' 18" 5	12° 2'	10 50' 4"
Mon.	25	142 55 32' 8	150 16 21' 7	S. 0° 4 31' 9	N. 0° 36' 9" 0	13° 2'	11 47' 9"
Tues.	26	157 34 35' 0	164 49 22' 7	N. 1° 15' 58" 4	1 54 14' 1	14° 2'	12 42' 7"
Wed.	27	171 59 59' 8	179 5 47' 1	2 30 17' 2	3 3 34' 4	15° 2'	13 35' 0"
Thur.	28	186 6 12' 6	193 0 52' 1	3 33 38' 2	4 0 7' 7	16° 2'	14 25' 2"
	29	199 49 29' 8	206 31 58' 3	N. 4° 22' 47" 5	N. 4° 41' 28" 1	17° 2'	15 13' 8"



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 1.				SUNDAY 3.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	12 50 10.87	S. 1 5 56.6	111.35	0	14 29 7.97	S. 9 21 31.7	92.22
1	12 52 17.40	1 17 4.7	111.10	1	14 31 9.80	9 30 45.0	91.67
2	12 54 23.76	1 28 11.3	110.88	2	14 33 11.61	9 39 55.0	91.12
3	12 56 29.96	1 39 16.6	110.63	3	14 35 13.38	9 49 1.7	90.57
4	12 58 36.00	1 50 20.4	110.37	4	14 37 15.12	9 58 5.1	90.00
5	13 0 41.88	2 1 22.6	110.12	5	14 39 16.84	10 7 5.1	89.43
6	13 2 47.60	2 12 23.3	109.85	6	14 41 18.54	10 16 1.7	88.85
7	13 4 53.18	2 23 22.4	109.57	7	14 43 20.21	10 24 54.8	88.28
8	13 6 58.60	2 34 19.8	109.27	8	14 45 21.86	10 33 44.5	87.70
9	13 9 3.89	2 45 15.4	109.00	9	14 47 23.50	10 42 30.7	87.12
10	13 11 9.02	2 56 9.4	108.67	10	14 49 25.12	10 51 13.4	86.52
11	13 13 14.02	3 7 1.4	108.38	11	14 51 26.72	10 59 52.5	85.93
12	13 15 18.89	3 17 51.7	108.05	12	14 53 28.32	11 8 28.1	85.32
13	13 17 23.62	3 28 40.0	107.73	13	14 55 29.91	11 17 0.0	84.73
14	13 19 28.23	3 39 26.4	107.40	14	14 57 31.49	11 25 28.4	84.10
15	13 21 32.70	3 50 10.8	107.05	15	14 59 33.06	11 33 53.0	83.50
16	13 23 37.06	4 0 53.1	106.72	16	15 1 34.64	11 42 14.0	82.87
17	13 25 41.29	4 11 33.4	106.35	17	15 3 36.21	11 50 31.2	82.27
18	13 27 45.40	4 22 11.5	106.00	18	15 5 37.78	11 58 44.8	81.62
19	13 29 49.40	4 32 47.5	105.63	19	15 7 39.35	12 6 54.5	81.00
20	13 31 53.29	4 43 21.3	105.25	20	15 9 40.92	12 15 0.5	80.37
21	13 33 57.06	4 53 52.8	104.87	21	15 11 42.51	12 23 2.7	79.72
22	13 36 0.73	5 4 22.0	104.47	22	15 13 44.10	12 31 1.0	79.07
23	13 38 4.30	S. 5 14 48.8	104.08	23	15 15 45.69	S. 12 38 55.4	78.43
SATURDAY 2.				MONDAY 4.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	13 40 7.77	S. 5 25 13.3	103.68	0	15 17 47.30	S. 12 46 46.0	77.78
1	13 42 11.14	5 35 35.4	103.27	1	15 19 48.92	12 54 32.7	77.12
2	13 44 14.41	5 45 55.0	102.85	2	15 21 50.56	13 2 15.4	76.47
3	13 46 17.59	5 56 12.1	102.43	3	15 23 52.21	13 9 54.2	75.80
4	13 48 20.68	6 6 26.7	102.00	4	15 25 53.88	13 17 29.0	75.12
5	13 50 23.69	6 16 38.7	101.58	5	15 27 55.56	13 24 59.7	74.47
6	13 52 26.61	6 26 48.2	101.12	6	15 29 57.27	13 32 26.5	73.78
7	13 54 29.45	6 36 54.9	100.68	7	15 31 59.00	13 39 49.2	73.08
8	13 56 32.21	6 46 59.0	100.23	8	15 34 0.75	13 47 7.7	72.42
9	13 58 34.90	6 57 0.4	99.77	9	15 36 2.53	13 54 22.2	71.73
10	14 0 37.51	7 6 59.0	99.32	10	15 38 4.33	14 1 32.6	71.03
11	14 2 40.06	7 16 54.9	98.83	11	15 40 6.16	14 8 38.8	70.33
12	14 4 42.54	7 26 47.9	98.37	12	15 42 8.01	14 15 40.8	69.63
13	14 6 44.95	7 36 38.1	97.87	13	15 44 9.90	14 22 38.6	68.93
14	14 8 47.31	7 46 25.3	97.40	14	15 46 11.82	14 29 32.2	68.22
15	14 10 49.60	7 56 9.7	96.90	15	15 48 13.77	14 36 21.5	67.52
16	14 12 51.83	8 5 51.1	96.40	16	15 50 15.75	14 43 6.6	66.80
17	14 14 54.02	8 15 29.5	95.88	17	15 52 17.76	14 49 47.4	66.08
18	14 16 56.15	8 25 4.8	95.38	18	15 54 19.82	14 56 23.9	65.35
19	14 18 58.23	8 34 37.1	94.88	19	15 56 21.90	15 2 56.0	64.63
20	14 21 0.26	8 44 6.4	94.35	20	15 58 24.03	15 9 23.8	63.90
21	14 23 2.25	8 53 32.5	93.82	21	16 0 26.1		63.17
22	14 25 4.20	9 2 55.4	93.28	22	16 2 28		
23	14 27 6.11	9 12 15.1	92.77	23	16 4 30		
24	14 29 7.97	S. 9 21 31.7		24	16 6 32		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 5.				THURSDAY 7.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	16 6 32.92	S. 15 34 30.9	60.95	0	17 45 17.53	S. 18 57 34.8	21.85
1	16 8 35.24	15 40 36.6	60.20	1	17 47 22.08	18 59 45.9	20.97
2	16 10 37.61	15 46 37.8	59.45	2	17 49 26.67	19 1 51.7	20.10
3	16 12 40.02	15 52 34.5	58.70	3	17 51 31.29	19 3 52.3	19.23
4	16 14 42.47	15 58 26.7	57.93	4	17 53 35.95	19 5 47.7	18.35
5	16 16 44.97	16 4 14.3	57.18	5	17 55 40.64	19 7 37.8	17.47
6	16 18 47.51	16 9 57.4	56.42	6	17 57 45.37	19 9 22.6	16.60
7	16 20 50.09	16 15 35.9	55.65	7	17 59 50.13	19 11 2.2	15.72
8	16 22 52.73	16 21 9.8	54.88	8	18 1 54.92	19 12 36.5	14.83
9	16 24 55.41	16 26 39.1	54.12	9	18 3 59.75	19 14 5.5	13.95
10	16 26 58.13	16 32 3.8	53.33	10	18 6 4.60	19 15 29.2	13.08
11	16 29 0.91	16 37 23.8	52.55	11	18 8 9.48	19 16 47.7	12.18
12	16 31 3.73	16 42 39.1	51.77	12	18 10 14.39	19 18 0.8	11.30
13	16 33 6.60	16 47 49.7	50.98	13	18 12 19.33	19 19 8.6	10.42
14	16 35 9.52	16 52 55.6	50.20	14	18 14 24.29	19 20 11.1	9.53
15	16 37 12.49	16 57 56.8	49.40	15	18 16 29.28	19 21 8.3	8.63
16	16 39 15.50	17 2 53.2	48.62	16	18 18 34.29	19 22 0.1	7.75
17	16 41 18.57	17 7 44.9	47.82	17	18 20 39.32	19 22 46.6	6.87
18	16 43 21.69	17 12 31.8	47.02	18	18 22 44.37	19 23 27.8	5.97
19	16 45 24.85	17 17 13.9	46.20	19	18 24 49.45	19 24 3.6	5.08
20	16 47 28.06	17 21 51.1	45.40	20	18 26 54.54	19 24 34.1	4.18
21	16 49 31.33	17 26 23.5	44.60	21	18 28 59.65	19 24 59.2	3.30
22	16 51 34.64	17 30 51.1	43.78	22	18 31 4.77	19 25 19.0	2.40
23	16 53 38.00	S. 17 35 13.8	42.97	23	18 33 9.91	S. 19 25 33.4	1.52
WEDNESDAY 6.				FRIDAY 8.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	16 55 41.41	S. 17 39 31.6	42.15	0	18 35 15.07	S. 19 25 42.5	0.62
1	16 57 44.87	17 43 44.5	41.33	1	18 37 20.24	19 25 46.2	0.27
2	16 59 48.38	17 47 52.5	40.50	2	18 39 25.41	19 25 44.6	1.17
3	17 1 51.94	17 51 55.5	39.68	3	18 41 30.60	19 25 37.6	2.07
4	17 3 55.55	17 55 53.6	38.87	4	18 43 35.79	19 25 25.2	2.95
5	17 5 59.21	17 59 46.8	38.02	5	18 45 40.99	19 25 7.5	3.85
6	17 8 2.92	18 3 34.9	37.20	6	18 47 46.20	19 24 44.4	4.75
7	17 10 6.68	18 7 18.1	36.35	7	18 49 51.41	19 24 15.9	5.63
8	17 12 10.48	18 10 56.2	35.53	8	18 51 56.62	19 23 42.1	6.52
9	17 14 14.33	18 14 29.4	34.68	9	18 54 1.84	19 23 3.0	7.43
10	17 16 18.23	18 17 57.5	33.83	10	18 56 7.05	19 22 18.4	8.32
11	17 18 22.18	18 21 20.5	33.00	11	18 58 12.27	19 21 28.5	9.20
12	17 20 26.17	18 24 38.5	32.15	12	19 0 17.47	19 20 33.3	10.10
13	17 22 30.21	18 27 51.4	31.30	13	19 2 22.68	19 19 32.7	11.00
14	17 24 34.29	18 30 59.2	30.45	14	19 4 27.88	19 18 26.7	11.88
15	17 26 38.42	18 34 1.9	29.60	15	19 6 33.08	19 17 15.4	12.77
16	17 28 42.60	18 36 59.5	28.75	16	19 8 38.27	19 15 58.8	13.67
17	17 30 46.82	18 39 52.0	27.88	17	19 10 43.45	19 14 36.8	14.55
18	17 32 51.08	18 42 39.3	27.03	18	19 12 48.62	19 13 9.5	15.43
19	17 34 55.38	18 45 21.5	26.17	19	19 14 53.77	19 11 36.9	16.33
20	17 36 59.73	18 47 58.5	25.32	20	19 16 58.92	19 9 58.9	17.22
21	17 39 4.12	18 50 30.4	24.45	21	19 19 4.05	19 8 15.6	18.10
	17 41 8.55	18 52 57.1	23.57	22	19 21 9.16	19 6 27.0	18.98
	17 43 13.02	18 55 18.5	22.72	23	19 23 14.26	19 4 33.1	19.87
	17 45 17.53	S. 18 57 34.8		24	19 25 19.34	S. 19 2 33.9	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
SATURDAY 9.				MONDAY 11.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	19 25 19.34	S.19 2 33.9	20.75	0	21 4 37.73	S.15 47 18.4
1	19 27 24.40	19 0 29.4	21.63	1	21 6 40.53	15 41 16.4
2	19 29 29.44	18 58 19.6	22.50	2	21 8 43.27	15 35 9.9
3	19 31 34.45	18 56 4.6	23.38	3	21 10 45.94	15 28 59.1
4	19 33 39.44	18 53 44.3	24.27	4	21 12 48.54	15 22 43.8
5	19 35 44.41	18 51 18.7	25.13	5	21 14 51.08	15 16 24.1
6	19 37 49.34	18 48 47.9	26.00	6	21 16 53.56	15 10 0.2
7	19 39 54.25	18 46 11.9	26.88	7	21 18 55.96	15 3 31.9
8	19 41 59.13	18 43 30.6	27.75	8	21 20 58.30	14 56 59.3
9	19 44 3.98	18 40 44.1	28.62	9	21 23 0.58	14 50 22.5
10	19 46 8.80	18 37 52.4	29.48	10	21 25 2.79	14 43 41.4
11	19 48 13.59	18 34 55.5	30.35	11	21 27 4.93	14 36 56.1
12	19 50 18.34	18 31 53.4	31.22	12	21 29 7.01	14 30 6.7
13	19 52 23.06	18 28 46.1	32.07	13	21 31 9.02	14 23 13.2
14	19 54 27.74	18 25 33.7	32.93	14	21 33 10.97	14 16 15.5
15	19 56 32.38	18 22 16.1	33.78	15	21 35 12.85	14 9 13.8
16	19 58 36.98	18 18 53.4	34.63	16	21 37 14.67	14 2 8.0
17	20 0 41.55	18 15 25.6	35.48	17	21 39 16.42	13 54 58.2
18	20 2 46.07	18 11 52.7	36.33	18	21 41 18.10	13 47 44.4
19	20 4 50.55	18 8 14.7	37.18	19	21 43 19.72	13 40 26.7
20	20 6 54.99	18 4 31.6	38.03	20	21 45 21.28	13 33 5.0
21	20 8 59.38	18 0 43.4	38.87	21	21 47 22.77	13 25 39.5
22	20 11 3.72	17 56 50.2	39.70	22	21 49 24.20	13 18 10.0
23	20 13 8.02	S.17 52 52.0	40.53	23	21 51 25.57	S.13 10 36.8
SUNDAY 10.				TUESDAY 12.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	20 15 12.27	S.17 48 48.8	41.37	0	21 53 26.87	S.13 2 59.7
1	20 17 16.47	17 44 40.6	42.20	1	21 55 28.11	12 55 18.8
2	20 19 20.62	17 40 27.4	43.03	2	21 57 29.29	12 47 34.3
3	20 21 24.72	17 36 9.2	43.85	3	21 59 30.41	12 39 46.0
4	20 23 28.77	17 31 46.1	44.67	4	22 1 31.47	12 31 54.0
5	20 25 32.77	17 27 18.1	45.48	5	22 3 32.47	12 23 58.4
6	20 27 36.71	17 22 45.2	46.30	6	22 5 33.41	12 15 59.2
7	20 29 40.60	17 18 7.4	47.12	7	22 7 34.29	12 7 56.5
8	20 31 44.43	17 13 24.7	47.92	8	22 9 35.12	11 59 50.2
9	20 33 48.21	17 8 37.2	48.72	9	22 11 35.89	11 51 40.4
10	20 35 51.93	17 3 44.9	49.52	10	22 13 36.60	11 43 27.1
11	20 37 55.59	16 58 47.8	50.32	11	22 15 37.25	11 35 10.5
12	20 39 59.20	16 53 45.9	51.12	12	22 17 37.85	11 26 50.4
13	20 42 2.75	16 48 39.2	51.88	13	22 19 38.40	11 18 27.0
14	20 44 6.24	16 43 27.9	52.68	14	22 21 38.89	11 10 0.3
15	20 46 9.67	16 38 11.8	53.47	15	22 23 39.33	11 1 30.3
16	20 48 13.03	16 32 51.0	54.25	16	22 25 39.72	10 52 57.1
17	20 50 16.34	16 27 25.5	55.02	17	22 27 40.06	10 44 20.7
18	20 52 19.59	16 21 55.4	55.80	18	22 29 40.36	10 35 41.0
19	20 54 22.77	16 16 20.6	56.55	19	22 31 40.60	10 26 58.3
20	20 56 25.89	16 10 41.3	57.32	20	22 33 40.80	10 18 12.4
21	20 58 28.95	16 4 57.4	58.08	21	22 35 40.96	10 9 23.5
22	21 0 31.94	15 59 8.9	58.83	22	22 37 41.07	10 0 31.6
23	21 2 34.87	15 53 15.9	59.58	23	22 39 41.14	9 51 36.6
24	21 4 37.73	S.15 47 18.4		24	22 41 41.16	S. 9 42 38.7



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
<i>WEDNESDAY 13.</i>				<i>FRIDAY 15.</i>			
0	22 41 41 <sup>16</sup>	S. 9 42 38 <sup>7</sup>	90 <sup>13</sup>	0	0 17 26 <sup>07</sup>	S. 1 47 28 <sup>2</sup>	105 <sup>48</sup>
1	22 43 41 <sup>15</sup>	9 33 37 <sup>9</sup>	90 <sup>63</sup>	1	0 19 26 <sup>23</sup>	1 36 55 <sup>3</sup>	105 <sup>63</sup>
2	22 45 41 <sup>09</sup>	9 24 34 <sup>1</sup>	91 <sup>08</sup>	2	0 21 26 <sup>45</sup>	1 26 21 <sup>5</sup>	105 <sup>75</sup>
3	22 47 41 <sup>00</sup>	9 15 27 <sup>6</sup>	91 <sup>57</sup>	3	0 23 26 <sup>72</sup>	1 15 47 <sup>0</sup>	105 <sup>90</sup>
4	22 49 40 <sup>88</sup>	9 6 18 <sup>2</sup>	92 <sup>02</sup>	4	0 25 27 <sup>06</sup>	1 5 11 <sup>6</sup>	106 <sup>00</sup>
5	22 51 40 <sup>72</sup>	8 57 6 <sup>1</sup>	92 <sup>47</sup>	5	0 27 27 <sup>46</sup>	0 54 35 <sup>6</sup>	106 <sup>13</sup>
6	22 53 40 <sup>52</sup>	8 47 51 <sup>3</sup>	92 <sup>93</sup>	6	0 29 27 <sup>93</sup>	0 43 58 <sup>8</sup>	106 <sup>22</sup>
7	22 55 40 <sup>30</sup>	8 38 33 <sup>7</sup>	93 <sup>35</sup>	7	0 31 28 <sup>48</sup>	0 33 21 <sup>5</sup>	106 <sup>32</sup>
8	22 57 40 <sup>04</sup>	8 29 13 <sup>6</sup>	93 <sup>80</sup>	8	0 33 29 <sup>09</sup>	0 22 43 <sup>6</sup>	106 <sup>42</sup>
9	22 59 39 <sup>76</sup>	8 19 50 <sup>8</sup>	94 <sup>23</sup>	9	0 35 29 <sup>78</sup>	0 12 5 <sup>1</sup>	106 <sup>48</sup>
10	23 1 39 <sup>45</sup>	8 10 25 <sup>4</sup>	94 <sup>63</sup>	10	0 37 30 <sup>55</sup>	S. 0 1 26 <sup>2</sup>	106 <sup>57</sup>
11	23 3 39 <sup>11</sup>	8 0 57 <sup>6</sup>	95 <sup>07</sup>	11	0 39 31 <sup>40</sup>	N. 0 9 13 <sup>2</sup>	106 <sup>63</sup>
12	23 5 38 <sup>75</sup>	7 51 27 <sup>2</sup>	95 <sup>47</sup>	12	0 41 32 <sup>33</sup>	0 19 53 <sup>0</sup>	106 <sup>68</sup>
13	23 7 38 <sup>37</sup>	7 41 54 <sup>4</sup>	95 <sup>87</sup>	13	0 43 33 <sup>35</sup>	0 30 33 <sup>1</sup>	106 <sup>73</sup>
14	23 9 37 <sup>97</sup>	7 32 19 <sup>2</sup>	96 <sup>25</sup>	14	0 45 34 <sup>46</sup>	0 41 13 <sup>5</sup>	106 <sup>78</sup>
15	23 11 37 <sup>55</sup>	7 22 41 <sup>7</sup>	96 <sup>65</sup>	15	0 47 35 <sup>66</sup>	0 51 54 <sup>2</sup>	106 <sup>80</sup>
16	23 13 37 <sup>11</sup>	7 13 1 <sup>8</sup>	97 <sup>03</sup>	16	0 49 36 <sup>96</sup>	1 2 35 <sup>0</sup>	106 <sup>83</sup>
17	23 15 36 <sup>66</sup>	7 3 19 <sup>6</sup>	97 <sup>40</sup>	17	0 51 38 <sup>35</sup>	1 13 16 <sup>0</sup>	106 <sup>85</sup>
18	23 17 36 <sup>19</sup>	6 53 35 <sup>2</sup>	97 <sup>77</sup>	18	0 53 39 <sup>85</sup>	1 23 57 <sup>1</sup>	106 <sup>85</sup>
19	23 19 35 <sup>71</sup>	6 43 48 <sup>6</sup>	98 <sup>13</sup>	19	0 55 41 <sup>45</sup>	1 34 38 <sup>2</sup>	106 <sup>87</sup>
20	23 21 35 <sup>23</sup>	6 33 59 <sup>8</sup>	98 <sup>47</sup>	20	0 57 43 <sup>15</sup>	1 45 19 <sup>4</sup>	106 <sup>85</sup>
21	23 23 34 <sup>73</sup>	6 24 9 <sup>0</sup>	98 <sup>83</sup>	21	0 59 44 <sup>96</sup>	1 56 0 <sup>5</sup>	106 <sup>83</sup>
22	23 25 34 <sup>23</sup>	6 14 16 <sup>0</sup>	99 <sup>17</sup>	22	1 1 46 <sup>89</sup>	2 6 41 <sup>5</sup>	106 <sup>82</sup>
23	23 27 33 <sup>73</sup>	S. 6 4 21 <sup>0</sup>	99 <sup>50</sup>	23	1 3 48 <sup>92</sup>	N. 2 17 22 <sup>4</sup>	106 <sup>78</sup>
<i>THURSDAY 14.</i>				<i>SATURDAY 16.</i>			
0	23 29 33 <sup>23</sup>	S. 5 54 24 <sup>0</sup>	99 <sup>83</sup>	0	1 5 51 <sup>07</sup>	N. 2 28 3 <sup>1</sup>	106 <sup>75</sup>
1	23 31 32 <sup>72</sup>	5 44 25 <sup>0</sup>	100 <sup>13</sup>	1	1 7 53 <sup>34</sup>	2 38 43 <sup>6</sup>	106 <sup>68</sup>
2	23 33 32 <sup>22</sup>	5 34 24 <sup>2</sup>	100 <sup>45</sup>	2	1 9 55 <sup>74</sup>	2 49 23 <sup>7</sup>	106 <sup>63</sup>
3	23 35 31 <sup>72</sup>	5 24 21 <sup>5</sup>	100 <sup>77</sup>	3	1 11 58 <sup>26</sup>	3 0 3 <sup>5</sup>	106 <sup>58</sup>
4	23 37 31 <sup>22</sup>	5 14 16 <sup>9</sup>	101 <sup>07</sup>	4	1 14 0 <sup>91</sup>	3 10 43 <sup>0</sup>	106 <sup>50</sup>
5	23 39 30 <sup>73</sup>	5 4 10 <sup>5</sup>	101 <sup>35</sup>	5	1 16 3 <sup>69</sup>	3 21 22 <sup>0</sup>	106 <sup>40</sup>
6	23 41 30 <sup>26</sup>	4 54 2 <sup>4</sup>	101 <sup>62</sup>	6	1 18 6 <sup>60</sup>	3 32 0 <sup>4</sup>	106 <sup>33</sup>
7	23 43 29 <sup>80</sup>	4 43 52 <sup>7</sup>	101 <sup>92</sup>	7	1 20 9 <sup>65</sup>	3 42 38 <sup>4</sup>	106 <sup>22</sup>
8	23 45 29 <sup>35</sup>	4 33 41 <sup>2</sup>	102 <sup>18</sup>	8	1 22 12 <sup>84</sup>	3 53 15 <sup>7</sup>	106 <sup>12</sup>
9	23 47 28 <sup>92</sup>	4 23 28 <sup>1</sup>	102 <sup>43</sup>	9	1 24 16 <sup>17</sup>	4 3 52 <sup>4</sup>	106 <sup>00</sup>
10	23 49 28 <sup>51</sup>	4 13 13 <sup>5</sup>	102 <sup>70</sup>	10	1 26 19 <sup>65</sup>	4 14 28 <sup>4</sup>	105 <sup>87</sup>
11	23 51 28 <sup>12</sup>	4 2 57 <sup>3</sup>	102 <sup>93</sup>	11	1 28 23 <sup>27</sup>	4 25 3 <sup>6</sup>	105 <sup>73</sup>
12	23 53 27 <sup>75</sup>	3 52 39 <sup>7</sup>	103 <sup>18</sup>	12	1 30 27 <sup>04</sup>	4 35 38 <sup>0</sup>	105 <sup>58</sup>
13	23 55 27 <sup>41</sup>	3 42 20 <sup>6</sup>	103 <sup>42</sup>	13	1 32 30 <sup>97</sup>	4 46 11 <sup>5</sup>	105 <sup>45</sup>
14	23 57 27 <sup>10</sup>	3 32 0 <sup>1</sup>	103 <sup>63</sup>	14	1 34 35 <sup>05</sup>	4 56 44 <sup>2</sup>	105 <sup>27</sup>
15	23 59 26 <sup>82</sup>	3 21 38 <sup>3</sup>	103 <sup>87</sup>	15	1 36 39 <sup>30</sup>	5 7 15 <sup>8</sup>	105 <sup>10</sup>
16	0 1 26 <sup>57</sup>	3 11 15 <sup>1</sup>	104 <sup>07</sup>	16	1 38 43 <sup>70</sup>	5 17 46 <sup>4</sup>	104 <sup>93</sup>
17	0 3 26 <sup>36</sup>	3 0 50 <sup>7</sup>	104 <sup>27</sup>	17	1 40 48 <sup>27</sup>	5 28 16 <sup>0</sup>	104 <sup>73</sup>
18	0 5 26 <sup>19</sup>	2 50 25 <sup>1</sup>	104 <sup>47</sup>	18	1 42 53 <sup>01</sup>	5 38 44 <sup>4</sup>	104 <sup>55</sup>
19	0 7 26 <sup>05</sup>	2 39 58 <sup>3</sup>	104 <sup>67</sup>	19	1 44 57 <sup>92</sup>	5 49 11 <sup>7</sup>	104 <sup>33</sup>
20	0 9 25 <sup>96</sup>	2 29 30 <sup>3</sup>	104 <sup>83</sup>	20	1 47 3 <sup>01</sup>	5 59 37 <sup>7</sup>	104 <sup>12</sup>
21	0 11 25 <sup>92</sup>	2 19 1 <sup>3</sup>	105 <sup>02</sup>	21	1 49 8 <sup>27</sup>	6 10 2 <sup>4</sup>	103 <sup>88</sup>
22	0 13 25 <sup>92</sup>	2 8 31 <sup>2</sup>	105 <sup>17</sup>	22	1 51 13 <sup>70</sup>	6 20 25 <sup>7</sup>	103 <sup>67</sup>
23	0 15 25 <sup>97</sup>	1 58 0 <sup>2</sup>	105 <sup>33</sup>	23	1 53 19 <sup>32</sup>	6 30 47 <sup>7</sup>	103 <sup>42</sup>
	0 17 26 <sup>07</sup>	S. 1 47 28 <sup>2</sup>		24	1 55 25 <sup>12</sup>	N. 6 41 8 <sup>2</sup>	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
<i>SUNDAY 17.</i>				<i>TUESDAY 19.</i>			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	1 55 25.12	N. 6 41 8.2	103.17	0	3 40 29.52	N. 14 9 49.0	79.33
1	1 57 31.11	6 51 27.2	102.90	1	3 42 47.24	14 17 45.0	78.57
2	1 59 37.29	7 1 44.6	102.63	2	3 45 5.25	14 25 36.4	77.80
3	2 1 43.67	7 12 0.4	102.35	3	3 47 23.55	14 33 23.2	77.03
4	2 3 50.24	7 22 14.5	102.07	4	3 49 42.13	14 41 5.4	76.23
5	2 5 57.01	7 32 26.9	101.77	5	3 52 1.00	14 48 42.8	75.45
6	2 8 3.98	7 42 37.5	101.45	6	3 54 20.15	14 56 15.5	74.62
7	2 10 11.15	7 52 46.2	101.13	7	3 56 39.59	15 3 43.2	73.82
8	2 12 18.53	8 2 53.0	100.82	8	3 58 59.32	15 11 6.1	72.97
9	2 14 26.11	8 12 57.9	100.47	9	4 1 19.34	15 18 23.9	72.13
10	2 16 33.91	8 23 0.7	100.13	10	4 3 39.65	15 25 36.7	71.27
11	2 18 41.92	8 33 1.5	99.77	11	4 6 0.25	15 32 44.3	70.42
12	2 20 50.15	8 43 0.1	99.40	12	4 8 21.13	15 39 46.8	69.53
13	2 22 58.60	8 52 56.5	99.03	13	4 10 42.30	15 46 44.0	68.65
14	2 25 7.27	9 2 50.7	98.63	14	4 13 3.76	15 53 35.9	67.75
15	2 27 16.16	9 12 42.5	98.23	15	4 15 25.51	16 0 22.4	66.83
16	2 29 25.28	9 22 31.9	97.85	16	4 17 47.55	16 7 3.4	65.92
17	2 31 34.63	9 32 19.0	97.42	17	4 20 9.87	16 13 38.9	65.00
18	2 33 44.21	9 42 3.5	96.98	18	4 22 32.48	16 20 8.9	64.03
19	2 35 54.02	9 51 45.4	96.57	19	4 24 55.37	16 26 33.1	63.10
20	2 38 4.07	10 1 24.8	96.10	20	4 27 18.55	16 32 51.7	62.13
21	2 40 14.36	10 11 1.4	95.65	21	4 29 42.01	16 39 4.5	61.15
22	2 42 24.89	10 20 35.3	95.20	22	4 32 5.76	16 45 11.4	60.17
23	2 44 35.66	N. 10 30 6.5	94.70	23	4 34 29.79	N. 16 51 12.4	59.18
<i>MONDAY 18.</i>				<i>WEDNESDAY 20.</i>			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	2 46 46.67	N. 10 39 34.7	94.22	0	4 36 54.09	N. 16 57 7.5	58.17
1	2 48 57.93	10 49 0.0	93.73	1	4 39 18.68	17 2 56.5	57.15
2	2 51 9.44	10 58 22.4	93.22	2	4 41 43.55	17 8 39.4	56.13
3	2 53 21.20	11 7 41.7	92.68	3	4 44 8.69	17 14 16.2	55.08
4	2 55 33.22	11 16 57.8	92.17	4	4 46 34.11	17 19 46.7	54.05
5	2 57 45.49	11 26 10.8	91.63	5	4 48 59.80	17 25 11.0	52.98
6	2 59 58.02	11 35 20.6	91.07	6	4 51 25.76	17 30 28.9	51.92
7	3 2 10.81	11 44 27.0	90.52	7	4 53 51.99	17 35 40.4	50.83
8	3 4 23.86	11 53 30.1	89.93	8	4 56 18.49	17 40 45.4	49.77
9	3 6 37.17	12 2 29.7	89.37	9	4 58 45.25	17 45 44.0	48.65
10	3 8 50.75	12 11 25.9	88.77	10	5 1 12.28	17 50 35.9	47.55
11	3 11 4.60	12 20 18.5	88.17	11	5 3 39.57	17 55 21.2	46.43
12	3 13 18.71	12 29 7.5	87.55	12	5 6 7.11	17 59 59.8	45.32
13	3 15 33.09	12 37 52.8	86.92	13	5 8 34.91	18 4 31.7	44.17
14	3 17 47.75	12 46 34.3	86.28	14	5 11 2.97	18 8 56.7	43.03
15	3 20 2.67	12 55 12.0	85.65	15	5 13 31.28	18 13 14.9	41.87
16	3 22 17.88	13 3 45.9	84.96	16	5 15 59.83	18 17 26.1	40.72
17	3 24 33.35	13 12 15.8	84.30	17	5 18 28.63	18 21 30.4	39.53
18	3 26 49.11	13 20 41.6	83.63	18	5 20 57.68	18 25 27.6	38.37
19	3 29 5.14	13 29 3.4	82.95	19	5 23 26.96	18 29 17.8	37.17
20	3 31 21.45	13 37 21.1	82.23	20	5 25 56.47	18 33 0.8	35
21	3 33 38.04	13 45 34.5	81.53	21	5 28 26.22	18 36 36.7	
22	3 35 54.92	13 53 43.7	80.82	22	5 30 56.19	18 40	
23	3 38 12.07	14 1 48.6	80.07	23	5 33 26.40	18 43	
24	3 40 29.52	N. 14 9 49.0		24	5 35 56.82	N. 18 46	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 21.				SATURDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	5 35 56.82	N.18 46 40.7	31.10	0	7 39 5.55	N.18 47 19.8	33.13
1	5 38 27.46	18 49 47.3	29.88	1	7 41 40.77	18 44 1.0	34.47
2	5 40 58.32	18 52 46.6	28.62	2	7 44 15.95	18 40 34.2	35.80
3	5 43 29.38	18 55 38.3	27.37	3	7 46 51.08	18 36 59.4	37.15
4	5 46 0.65	18 58 22.5	26.12	4	7 49 26.15	18 33 16.5	38.48
5	5 48 32.13	19 0 59.2	24.85	5	7 52 1.16	18 29 25.6	39.82
6	5 51 3.80	19 3 28.3	23.57	6	7 54 36.10	18 25 26.7	41.13
7	5 53 35.66	19 5 49.7	22.30	7	7 57 10.97	18 21 19.9	42.43
8	5 56 7.72	19 8 3.5	21.00	8	7 59 45.76	18 17 5.3	43.77
9	5 58 39.95	19 10 9.5	19.72	9	8 2 20.48	18 12 42.7	45.07
10	6 1 12.37	19 12 7.8	18.42	10	8 4 55.10	18 8 12.3	46.35
11	6 3 44.96	19 13 58.3	17.12	11	8 7 29.62	18 3 34.2	47.65
12	6 6 17.72	19 15 41.0	15.80	12	8 10 4.05	17 58 48.3	48.93
13	6 8 50.65	19 17 15.8	14.48	13	8 12 38.37	17 53 54.7	50.22
14	6 11 23.74	19 18 42.7	13.17	14	8 15 12.58	17 48 53.4	51.48
15	6 13 56.98	19 20 1.7	11.83	15	8 17 46.68	17 43 44.5	52.73
16	6 16 30.38	19 21 12.7	10.50	16	8 20 20.66	17 38 28.1	54.00
17	6 19 3.92	19 22 15.7	9.18	17	8 22 54.52	17 33 4.1	55.23
18	6 21 37.60	19 23 10.8	7.82	18	8 25 28.24	17 27 32.7	56.48
19	6 24 11.42	19 23 57.7	6.48	19	8 28 1.83	17 21 53.8	57.72
20	6 26 45.36	19 24 36.6	5.15	20	8 30 35.28	17 16 7.5	58.92
21	6 29 19.43	19 25 7.5	3.78	21	8 33 8.59	17 10 14.0	60.15
22	6 31 53.62	19 25 30.2	2.42	22	8 35 41.75	17 4 13.1	61.33
23	6 34 27.92	N.19 25 44.7	1.08	23	8 38 14.76	N.16 58 5.1	62.53
FRIDAY 22.				SUNDAY 24.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	6 37 2.33	N.19 25 51.2	0.30	0	8 40 47.61	N.16 51 49.9	63.72
1	6 39 36.85	19 25 49.4	1.65	1	8 43 20.30	16 45 27.6	64.88
2	6 42 11.46	19 25 39.5	3.02	2	8 45 52.82	16 38 58.3	66.05
3	6 44 46.16	19 25 21.4	4.40	3	8 48 25.18	16 32 22.0	67.20
4	6 47 20.94	19 24 55.0	5.75	4	8 50 57.36	16 25 38.8	68.35
5	6 49 55.81	19 24 20.5	7.13	5	8 53 29.36	16 18 48.7	69.48
6	6 52 30.75	19 23 37.7	8.50	6	8 56 1.19	16 11 51.8	70.58
7	6 55 5.75	19 22 46.7	9.88	7	8 58 32.83	16 4 48.3	71.72
8	6 57 40.82	19 21 47.4	11.25	8	9 1 4.27	15 57 38.0	72.80
9	7 0 15.95	19 20 39.9	12.63	9	9 3 35.53	15 50 21.2	73.88
10	7 2 51.12	19 19 24.1	14.00	10	9 6 6.60	15 42 57.9	74.97
11	7 5 26.35	19 18 0.1	15.37	11	9 8 37.46	15 35 28.1	76.02
12	7 8 1.60	19 16 27.9	16.75	12	9 11 8.12	15 27 52.0	77.08
13	7 10 36.89	19 14 47.4	18.12	13	9 13 38.57	15 20 9.5	78.12
14	7 13 12.21	19 12 58.7	19.50	14	9 16 8.82	15 12 20.8	79.13
15	7 15 47.55	19 11 1.7	20.87	15	9 18 38.86	15 4 26.0	80.15
16	7 18 22.90	19 8 56.5	22.25	16	9 21 8.68	14 56 25.1	81.17
17	7 20 58.26	19 6 43.0	23.60	17	9 23 38.29	14 48 18.1	82.13
18	7 23 33.62	19 4 21.4	24.97	18	9 26 7.67	14 40 5.3	83.12
19	7 26 8.99	19 1 51.6	26.35	19	9 28 36.84	14 31 46.6	84.08
	7 28 44.34	18 59 13.5	27.70	20	9 31 5.78	14 23 22.1	85.02
		18 56 27.3	29.07	21	9 33 34.50	14 14 52.0	85.97
		18 53 32.9	30.42	22	9 36 2.99	14 6 16.2	86.88
		30.4	31.77	23	9 38 31.24	13 57 34.9	87.80
				24	9 40 59.27	N.13 48 48.1	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	
MONDAY 25.				WEDNESDAY 27.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
0	9 40 59.27	N. 13 48 48.1	88.68	0	11 34 35.20	N. 5 28 35.4	1
1	9 43 27.06	13 39 56.0	89.57	1	11 36 51.27	5 17 7.2	1
2	9 45 54.62	13 30 58.6	90.43	2	11 39 7.12	5 5 37.8	1
3	9 48 21.93	13 21 56.0	91.28	3	11 41 22.74	4 54 7.3	1
4	9 50 49.01	13 12 48.3	92.13	4	11 43 38.14	4 42 35.8	1
5	9 53 15.84	13 3 35.5	92.95	5	11 45 53.32	4 31 3.5	1
6	9 55 42.44	12 54 17.8	93.75	6	11 48 8.29	4 19 30.3	1
7	9 58 8.79	12 44 55.3	94.57	7	11 50 23.04	4 7 56.3	1
8	10 0 34.89	12 35 27.9	95.33	8	11 52 37.58	3 56 21.7	1
9	10 3 0.75	12 25 55.9	96.12	9	11 54 51.91	3 44 46.5	1
10	10 5 26.36	12 16 19.2	96.87	10	11 57 6.03	3 33 10.8	1
11	10 7 51.72	12 6 38.0	97.60	11	11 59 19.95	3 21 34.6	1
12	10 10 16.83	11 56 52.4	98.33	12	12 1 33.65	3 9 58.1	1
13	10 12 41.69	11 47 2.4	99.03	13	12 3 47.16	2 58 21.3	1
14	10 15 6.31	11 37 8.2	99.75	14	12 6 0.46	2 46 44.2	1
15	10 17 30.67	11 27 9.7	100.42	15	12 8 13.57	2 35 7.1	1
16	10 19 54.79	11 17 7.2	101.08	16	12 10 26.48	2 23 29.8	1
17	10 22 18.65	11 7 0.7	101.73	17	12 12 39.20	2 11 52.6	1
18	10 24 42.26	10 56 50.3	102.38	18	12 14 51.73	2 0 15.5	1
19	10 27 5.62	10 46 36.0	103.00	19	12 17 4.07	1 48 38.5	1
20	10 29 28.72	10 36 18.0	103.60	20	12 19 16.22	1 37 1.7	1
21	10 31 51.58	10 25 56.4	104.20	21	12 21 28.18	1 25 25.3	1
22	10 34 14.18	10 15 31.2	104.78	22	12 23 39.96	1 13 49.2	1
23	10 36 36.53	N. 10 5 2.5	105.33	23	12 25 51.56	N. 1 2 13.6	1
TUESDAY 26.				THURSDAY 28.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
0	10 38 58.63	N. 9 54 30.5	105.88	0	12 28 2.98	N. 0 50 38.4	1
1	10 41 20.48	9 43 55.2	106.42	1	12 30 14.23	0 39 3.9	1
2	10 43 42.07	9 33 16.7	106.95	2	12 32 25.30	0 27 30.0	1
3	10 46 3.42	9 22 35.0	107.43	3	12 34 36.20	0 15 56.8	1
4	10 48 24.51	9 11 50.4	107.93	4	12 36 46.93	N. 0 4 24.4	1
5	10 50 45.36	9 1 2.8	108.40	5	12 38 57.50	S. 0 7 7.2	1
6	10 53 5.95	8 50 12.4	108.87	6	12 41 7.90	0 18 37.9	1
7	10 55 26.30	8 39 19.2	109.32	7	12 43 18.14	0 30 7.5	1
8	10 57 46.40	8 28 23.3	109.75	8	12 45 28.22	0 41 36.2	1
9	11 0 6.25	8 17 24.8	110.17	9	12 47 38.15	0 53 3.7	1
10	11 2 25.86	8 6 23.8	110.57	10	12 49 47.91	1 4 30.1	1
11	11 4 45.22	7 55 20.4	110.95	11	12 51 57.53	1 15 55.2	1
12	11 7 4.34	7 44 14.7	111.33	12	12 54 7.00	1 27 19.1	1
13	11 9 23.22	7 33 6.7	111.68	13	12 56 16.32	1 38 41.6	1
14	11 11 41.85	7 21 56.6	112.03	14	12 58 25.50	1 50 2.7	1
15	11 14 0.25	7 10 44.4	112.37	15	13 0 34.53	2 1 22.4	1
16	11 16 18.40	6 59 30.2	112.68	16	13 2 43.42	2 12 40.5	1
17	11 18 36.32	6 48 14.1	112.98	17	13 4 52.18	2 23 57.0	1
18	11 20 54.00	6 36 56.2	113.27	18	13 7 0.80	2 35 11.9	1
19	11 23 11.45	6 25 36.6	113.55	19	13 9 9.28	2 46 25.1	1
20	11 25 28.66	6 14 15.3	113.80	20	13 11 17.64	2 57 36.5	1
21	11 27 45.64	6 2 52.5	114.07	21	13 13 25.87	3 8 46.1	1
22	11 30 2.39	5 51 28.1	114.28	22	13 15 33.97	3 19 53.8	1
23	11 32 18.91	5 40 2.4	114.50	23	13 17 41.94	3 30 59.7	1
24	11 34 35.20	N. 5 28 35.4		24	13 19 49.80	S. 3 42 3.5	1

## MEAN TIME.

## PHASES OF THE MOON.

	d	h	m
☾ <i>Last Quarter</i> - - - - -	8	13	18.1
● <i>New Moon</i> - - - - -	11	18	29.0
☾ <i>First Quarter</i> - - - - -	19	8	11.9
○ <i>Full Moon</i> - - - - -	26	0	0.5

	d	h
☾ <i>Apogee</i> - - - - -	8	3
☾ <i>Perigee</i> - - - - -	23	23



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>
1	Pollux W.	80 26 15	2595	82 5 17	2614	83 43 53	2632	85 22 4
	Regulus W.	44 18 53	2534	45 59 19	2553	47 39 19	2572	49 18 53
	Jupiter W.	19 59 38	2516	21 40 29	2534	23 20 55	2551	25 0 57
	Antares E.	56 17 23	2627	54 39 4	2649	53 1 16	2672	51 23 59
	α Aquilæ E.	103 19 49	3065	101 50 56	3078	100 22 19	3091	98 53 58
	SUN E.	120 17 44	2876	118 44 54	2896	117 12 30	2916	115 40 32
2	Pollux W.	93 26 49	2742	95 2 33	2760	96 37 54	2778	98 12 52
	Regulus W.	57 30 23	2681	59 7 28	2699	60 44 9	2717	62 20 27
	Jupiter W.	33 14 57	2658	34 52 33	2675	36 29 46	2692	38 6 37
	Antares E.	43 25 33	2820	41 51 31	2846	40 18 3	2874	38 45 11
	α Aquilæ E.	91 36 45	3184	90 10 17	3202	88 44 10	3220	87 18 24
	SUN E.	108 7 0	3035	106 37 31	3054	105 8 25	3073	103 39 42
3	Pollux W.	106 2 4	2879	107 34 50	2894	109 7 16	2910	110 39 22
	Regulus W.	70 16 30	2813	71 50 41	2828	73 24 33	2843	74 58 5
	Jupiter W.	46 5 28	2786	47 40 14	2802	49 14 40	2816	50 48 47
	Spica ηγ W.	17 43 9	3113	19 11 3	3085	20 39 31	3064	22 8 24
	Antares E.	31 10 20	3067	29 41 30	3108	28 13 30	3152	26 46 23
	α Aquilæ E.	80 15 6	3335	78 51 35	3356	77 28 28	3377	76 5 45
	SUN E.	96 21 34	3178	94 54 58	3194	93 28 41	3209	92 2 43
4	Regulus W.	82 41 25	2921	84 13 17	2933	85 44 54	2945	87 16 16
	Jupiter W.	58 35 6	2893	60 7 34	2905	61 39 47	2916	63 11 46
	Spica ηγ W.	29 35 24	3034	31 4 55	3037	32 34 22	3039	34 3 46
	α Aquilæ E.	69 18 23	3513	67 58 13	3537	66 38 30	3562	65 19 14
	SUN E.	84 57 16	3296	83 33 0	3308	82 8 58	3319	80 45 9
5	Regulus W.	94 49 57	3002	96 20 7	3010	97 50 7	3018	99 19 58
	Jupiter W.	70 48 33	2971	72 19 21	2980	73 49 59	2988	75 20 27
	Spica ηγ W.	41 29 31	3065	42 58 23	3070	44 27 9	3074	45 55 50
	α Aquilæ E.	58 50 21	3734	57 34 10	3767	56 18 33	3802	55 3 33
	SUN E.	73 49 19	3383	72 26 43	3392	71 4 17	3401	69 42 1
6	Regulus W.	106 47 7	3055	108 16 12	3060	109 45 11	3064	111 14 5
	Jupiter W.	82 50 49	3023	84 20 33	3027	85 50 12	3032	87 19 45
	Spica ηγ W.	53 17 57	3098	54 46 9	3101	56 14 18	3104	57 42 23
	α Aquilæ E.	48 58 34	4058	47 47 51	4110	46 37 59	4168	45 29 3
	SUN E.	62 52 42	3440	61 31 11	3445	60 9 45	3450	58 48 25
7	Jupiter W.	94 46 36	3048	96 15 50	3049	97 45 2	3049	99 14 14
	Spica ηγ W.	65 2 10	3114	66 30 2	3115	67 57 54	3115	69 25 45
	Antares W.	20 52 8	3593	22 10 50	3534	23 30 37	3484	24 51 19
	SUN E.	52 2 42	3468	50 41 42	3469	49 20 43	3470	47 59 46
8	Jupiter W.	106 40 8	3048	108 9 22	3047	109 38 37	3045	111 7 54
	Spica ηγ W.	76 45 7	3111	78 13 3	3110	79 41 1	3108	81 9 1
	Antares W.	31 44 34	3306	33 8 39	3288	34 33 4	3271	35 57 49
	SUN E.	41 15 3	3469	39 54 4	3468	38 33 4	3465	37 12 1
9	Spica ηγ W.	88 29 47	3092	89 58 7	3088	91 26 31	3084	92 55 0
	Antares W.	43 5 35	3196	44 31 49	3185	45 58 16	3175	47 24
	SUN E.	30 26 8	3449	29 4 47	3445	27 43 21	3441	26 9
14	SUN W.	25 17 8	3178	26 43 43	3171	28 10 27	3162	29



MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Star's Name and Position.		Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
			° ' "		° ' "		° ' "		° ' "	
1	Pollux	W.	86 59 50	2669	88 37 12	2687	90 14 9	2706	91 50 41	2724
	Regulus	W.	50 58 1	2609	52 36 44	2627	54 15 2	2646	55 52 54	2663
	Jupiter	W.	26 40 33	2588	28 19 45	2605	29 58 33	2623	31 36 57	2641
	Antares	E.	49 47 13	2720	48 11 0	2744	46 35 18	2769	45 0 9	2794
	α Aquilæ	E.	97 25 54	3119	95 58 8	3135	94 30 41	3151	93 3 33	3168
	SUN	E.	114 9 0	2957	112 37 53	2977	111 7 11	2996	109 36 53	3016
2	Pollux	W.	99 47 26	2811	101 21 39	2829	102 55 29	2846	104 28 57	2863
	Regulus	W.	63 56 23	2750	65 31 56	2766	67 7 9	2782	68 42 0	2798
	Jupiter	W.	39 43 6	2725	41 19 13	2741	42 54 59	2757	44 30 24	2772
	Antares	E.	37 12 54	2931	35 41 15	2962	34 10 15	2995	32 39 56	3030
	α Aquilæ	E.	85 53 0	3256	84 27 57	3276	83 3 17	3295	81 39 0	3315
	SUN	E.	102 11 22	3109	100 43 23	3127	99 15 46	3144	97 48 30	3161
3	Pollux	W.	112 11 7	2941	113 42 34	2957	115 13 41	2972	116 44 29	2986
	Regulus	W.	76 31 19	2870	78 4 16	2884	79 36 55	2897	81 9 18	2909
	Jupiter	W.	52 22 37	2843	53 56 9	2856	55 29 24	2869	57 2 23	2881
	Spica ♀	W.	23 37 34	3042	25 6 55	3036	26 36 23	3035	28 5 53	3034
	Antares	E.	25 20 16	3257	23 55 14	3320	22 31 26	3394	21 9 3	3481
	α Aquilæ	E.	74 43 26	3420	73 21 32	3442	72 0 3	3465	70 39 0	3488
	SUN	E.	90 37 4	3240	89 11 42	3254	87 46 37	3269	86 21 49	3282
4	Regulus	W.	88 47 25	2966	90 18 21	2975	91 49 5	2985	93 19 37	2994
	Jupiter	W.	64 43 32	2936	66 15 5	2946	67 46 26	2955	69 17 35	2964
	Spica ♀	W.	35 33 6	3048	37 2 20	3051	38 31 30	3056	40 0 33	3061
	α Aquilæ	E.	64 0 27	3615	62 42 9	3644	61 24 22	3672	60 7 5	3703
	SUN	E.	79 21 34	3343	77 58 12	3354	76 35 3	3364	75 12 5	3374
5	Regulus	W.	100 49 39	3032	102 19 12	3039	103 48 37	3044	105 17 55	3049
	Jupiter	W.	76 50 47	3001	78 20 59	3007	79 51 3	3013	81 20 59	3018
	Spica ♀	W.	47 24 25	3083	48 52 56	3087	50 21 21	3092	51 49 41	3095
	α Aquilæ	E.	53 49 10	3877	52 35 27	3918	51 22 25	3961	50 10 7	4007
	SUN	E.	68 19 54	3416	66 57 55	3422	65 36 3	3429	64 14 19	3435
6	Regulus	W.	112 42 54	3070	114 11 40	3074	115 40 22	3076	117 9 1	3078
	Jupiter	W.	88 49 14	3039	90 18 39	3041	91 48 1	3043	93 17 20	3046
	Spica ♀	W.	59 10 25	3109	60 38 24	3110	62 6 21	3112	63 34 16	3113
	α Aquilæ	E.	44 21 5	4296	43 14 9	4370	42 8 21	4450	41 3 45	4538
	SUN	E.	57 27 9	3457	56 5 57	3461	54 44 49	3463	53 23 44	3466
7	Jupiter	W.	100 43 24	3050	102 12 35	3051	103 41 45	3050	105 10 56	3049
	Spica ♀	W.	70 53 36	3115	72 21 27	3115	73 49 19	3113	75 17 13	3113
	Antares	W.	26 12 48	3407	27 34 57	3377	28 57 40	3350	30 20 54	3327
	SUN	E.	46 38 49	3472	45 17 53	3472	43 56 57	3471	42 36 0	3471
8	Jupiter	W.	112 37 13	3041	114 6 35	3038	115 36 1	3035	117 5 30	3032
	Spica ♀	W.	82 37 4	3103	84 5 10	3101	85 33 18	3097	87 1 31	3095
	Antares	W.	37 22 51	3242	38 48 10	3230	40 13 44	3217	41 39 33	3206
	SUN	E.	35 50 57	3462	34 29 50	3458	33 8 39	3456	31 47 26	3452
9	Spica ♀	W.	94 23 33	3077	95 52 11	3072	97 20 55	3068	98 49 44	3064
	Antares	W.	48 51 45	3157	50 18 46	3148	51 45 57	3138	53 13 20	3131
	SUN	E.	25 0 16	3432	23 38 35	3428	22 16 50	3423	20 54 59	3417
10				3144	32 31 43	3135	33 59 10	3126	35 26 48	3116



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	P.L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>	
14	$\alpha$ Arietis E.	46 22 14	3121	44 54 30	3130	43 26 57	3142	41 59 38	3142
	Aldebaran E.	76 51 3	2816	75 16 56	2808	73 42 39	2801	72 8 12	2801
	Mars E.	89 56 30	2935	88 24 56	2928	86 53 12	2920	85 21 19	2920
	Pollux E.	120 32 13	2896	118 59 49	2887	117 27 13	2876	115 54 23	2876
15	Sun W.	36 54 38	3108	38 22 38	3099	39 50 49	3089	41 19 12	3089
	$\alpha$ Arietis E.	34 48 13	3271	33 23 27	3308	31 59 25	3352	30 36 14	3352
	Aldebaran E.	64 13 16	2781	62 37 44	2742	61 2 0	2734	59 26 5	2734
	Mars E.	77 39 23	2873	76 6 30	2866	74 33 27	2858	73 0 14	2858
	Pollux E.	108 7 3	2817	106 32 57	2807	104 58 38	2798	103 24 7	2798
16	Sun W.	48 44 4	3031	50 13 39	3020	51 43 27	3010	53 13 28	3010
	Saturn W.	10 37 59	2744	12 13 41	2729	13 49 43	2714	15 26 4	2714
	Aldebaran E.	51 23 34	2680	49 46 27	2670	48 9 7	2661	46 31 35	2661
	Mars E.	65 11 33	2810	63 37 18	2802	62 2 52	2794	60 28 16	2794
	Pollux E.	95 28 24	2741	93 52 38	2730	92 16 38	2721	90 40 26	2721
17	Sun W.	60 46 48	2946	62 18 9	2934	63 49 45	2923	65 21 34	2923
	Saturn W.	23 31 53	2644	25 9 48	2632	26 47 59	2621	28 26 25	2621
	Aldebaran E.	38 20 36	2602	36 41 43	2591	35 2 36	2581	33 23 15	2581
	Mars E.	52 32 40	2747	50 57 3	2739	49 21 15	2732	47 45 18	2732
	Pollux E.	82 36 12	2663	80 58 42	2652	79 20 58	2643	77 43 2	2643
	Regulus E.	118 29 18	2602	116 50 25	2591	115 11 17	2581	113 31 56	2581
18	Sun W.	73 4 24	2852	74 37 44	2841	76 11 19	2828	77 45 10	2828
	Saturn W.	36 42 22	2553	38 22 21	2543	40 2 34	2531	41 43 4	2531
	Aldebaran E.	25 2 48	2516	23 21 57	2505	21 40 51	2494	19 59 29	2494
	Mars E.	39 43 24	2696	38 6 39	2693	36 29 49	2690	34 52 55	2690
	Pollux E.	69 30 2	2585	67 50 46	2576	66 11 18	2566	64 31 36	2566
	Regulus E.	105 11 28	2515	103 30 36	2504	101 49 29	2494	100 8 7	2494
19	Sun W.	85 38 27	2754	87 13 55	2741	88 49 41	2728	90 25 43	2728
	Saturn W.	50 9 38	2461	51 51 46	2449	53 34 11	2437	55 16 53	2437
	$\alpha$ Arietis W.	25 34 10	3332	26 57 44	3319	28 23 31	3312	29 51 15	3312
	Mars E.	26 48 37	2710	25 12 11	2724	23 36 3	2745	22 0 23	2745
	Pollux E.	56 10 1	2513	54 29 6	2506	52 48 1	2498	51 6 45	2498
	Regulus E.	91 37 12	2424	89 54 11	2412	88 10 54	2401	86 27 21	2401
	Jupiter E.	114 13 1	2389	112 29 10	2377	110 45 2	2365	109 0 37	2365
20	Sun W.	98 30 6	2652	100 7 50	2640	101 45 50	2628	103 24 7	2628
	Saturn W.	63 54 37	2366	65 39 0	2355	67 23 40	2343	69 8 37	2343
	$\alpha$ Arietis W.	37 32 10	2745	39 7 50	2704	40 44 25	2666	42 21 51	2666
	Pollux E.	42 38 19	2468	40 56 21	2465	39 14 20	2467	37 32 20	2467
	Regulus E.	77 45 18	2331	76 0 3	2319	74 14 31	2307	72 28 42	2307
	Jupiter E.	100 14 17	2295	98 28 10	2283	96 41 46	2272	94 55 5	2272
21	Sun W.	111 39 40	2556	113 19 35	2546	114 59 45	2534	116 40 11	2534
	Saturn W.	77 57 30	2276	79 44 5	2266	81 30 55	2255	83 18 1	2255
	$\alpha$ Arietis W.	47	2492	52 21 11	2470	54 3 7	2448	55 45 33	2448
	Aldebaran E.			18 20 56	2231	20 8 37	2221	21 56 34	2221
	Pollux E.			27 23 30	2548	25 43 24	2583	24 4 6	2583
	Regulus E.			49	2230	60 0 21	2220	58 12 24	2220
	Jupiter E.			2	2195	82 20 37	2185	80 31 47	2185
	Spica <i>ng</i>					113 36 31	2254	111 49 23	2254



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>a</sup> .	P.L. of diff.	XVIII <sup>b</sup> .	P.L. of diff.	XXI <sup>c</sup> .	P.L. of diff.
		° ' "		° ' "		° ' "		° ' "	
14	α Arietis E.	40 32 35	3171	39 5 51	3190	37 39 30	3212	36 13 35	3240
	Aldebaran E.	70 33 35	2784	68 58 46	2776	67 23 47	2768	65 48 37	2760
	Mars E.	83 49 16	2905	82 17 3	2897	80 44 40	2889	79 12 7	2880
	Pollux E.	114 21 21	2856	112 48 5	2846	111 14 37	2836	109 40 56	2827
15	Sun W.	42 47 47	3070	44 16 33	3061	45 45 31	3050	47 14 42	3041
	α Arietis E.	29 14 3	3469	27 53 4	3545	26 33 29	3635	25 15 32	3747
	Aldebaran E.	57 49 59	2717	56 13 41	2707	54 37 10	2698	53 0 28	2690
	Mars E.	71 26 50	2841	69 53 16	2834	68 19 32	2826	66 45 38	2818
	Pollux E.	101 49 24	2779	100 14 28	2769	98 39 19	2760	97 3 58	2750
16	Sun W.	54 43 41	2989	56 14 8	2979	57 44 47	2967	59 15 41	2957
	Saturn W.	17 2 42	2689	18 39 37	2678	20 16 47	2666	21 54 12	2655
	Aldebaran E.	44 53 50	2641	43 15 51	2632	41 37 40	2622	39 59 15	2612
	Mars E.	58 53 30	2778	57 18 33	2769	55 43 25	2763	54 8 8	2754
	Pollux E.	89 4 1	2701	87 27 23	2692	85 50 32	2683	84 13 29	2672
17	Sun W.	66 53 39	2900	68 25 57	2888	69 58 31	2877	71 31 20	2865
	Saturn W.	30 5 6	2599	31 44 2	2588	33 23 13	2577	35 2 40	2566
	Aldebaran E.	31 43 39	2560	30 3 49	2548	28 23 43	2538	26 43 23	2528
	Mars E.	46 9 12	2719	44 32 57	2713	42 56 34	2706	41 20 2	2701
	Pollux E.	76 4 53	2624	74 26 30	2614	72 47 54	2604	71 9 4	2595
	Regulus E.	111 52 20	2559	110 12 29	2549	108 32 24	2538	106 52 3	2528
18	Sun W.	79 19 17	2804	80 53 40	2792	82 28 19	2779	84 3 14	2766
	Saturn W.	43 23 50	2508	45 4 53	2497	46 46 11	2485	48 27 46	2472
	Aldebaran E.	18 17 52	2471	16 35 58	2460	14 53 49	2448	13 11 23	2437
	Mars E.	33 15 59	2688	31 39 3	2689	30 2 8	2692	28 25 18	2699
	Pollux E.	62 51 42	2548	61 11 35	2539	59 31 16	2530	57 50 44	2522
	Regulus E.	98 26 28	2471	96 44 34	2459	95 2 23	2448	93 19 56	2436
19	Sun W.	92 2 1	2703	93 38 37	2690	95 15 30	2678	96 52 40	2666
	Saturn W.	56 59 52	2413	58 43 8	2401	60 26 41	2390	62 10 30	2378
	α Arietis W.	31 20 41	2965	32 51 38	2899	34 23 58	2843	35 57 30	2791
	Mars E.	20 25 21	2814	18 51 11	2870	17 18 13	2946	15 46 52	3054
	Pollux E.	49 25 19	2485	47 43 45	2480	46 2 3	2475	44 20 14	2470
	Regulus E.	84 43 30	2378	82 59 23	2365	81 14 58	2354	79 30 17	2342
	Jupiter E.	107 15 55	2341	105 30 56	2330	103 45 40	2318	102 0 7	2307
20	Sun W.	105 2 41	2603	106 41 32	2591	108 20 39	2580	110 0 1	2568
	Saturn W.	70 53 51	2319	72 39 22	2309	74 25 8	2298	76 11 11	2287
	α Arietis W.	44 0 5	2599	45 39 2	2569	47 18 40	2541	48 58 56	2516
	Pollux E.	35 50 22	2472	34 8 30	2479	32 26 47	2489	30 45 19	2504
	Regulus E.	70 42 37	2285	68 56 15	2273	67 9 36	2262	65 22 41	2252
	Jupiter E.	93 8 7	2249	91 20 53	2238	89 33 22	2227	87 45 35	2216
21	Sun W.	118 20 51	2513	120 1 46	2503	121 42 55	2493	123 24 18	2484
	Saturn W.	85 5 21	2235	86 52 57	2226	88 40 46	2217	90 28 49	2208
	α Arietis W.	57 28 26	2410	59 11 46	2393	60 55 30	2377	62 39 37	2362
	Aldebaran W.	23 44 45	2200	25 33 12	2191	27 21 53	2182	29 10 47	2173
	Pollux E.	22 25 49	2687	20 48 52	2766	19 13 40	2873	17 40 46	3017
	Regulus E.	56 24 12	2200	54 35 45	2190	52 47 3	2182	50 58 8	2173
	Jupiter E.	78 42 42	2165	76 53 22	2156	75 3 48	2147	73 14 0	2138
	Spica η E.	110 1 59	2233	108 14 20	2222	106 26 25	2212	104 38 15	2202



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
22	SUN W.	125 5 54	2474	126 47 43	2466	128 29 44	2458	130 11 57	2450
	Saturn W.	92 17 5	2199	94 5 34	2191	95 54 15	2183	97 43 8	2175
	α Arietis W.	64 24 6	2348	66 8 56	2335	67 54 5	2322	69 39 32	2311
	Aldebaran W.	30 59 55	2165	32 49 16	2157	34 38 49	2149	36 28 34	2141
	Mars W.	17 25 18	2662	19 2 49	2585	20 42 4	2525	22 22 42	2477
	Regulus E.	49 9 0	2165	47 19 39	2156	45 30 5	2149	43 40 20	2141
	Jupiter E.	71 23 58	2130	69 33 44	2121	67 43 17	2114	65 52 39	2106
	Spica ♀ E.	102 49 52	2194	101 1 15	2185	99 12 25	2178	97 23 24	2170
23	Saturn W.	106 50 9	2145	108 39 59	2140	110 29 57	2137	112 20 0	2133
	α Arietis W.	78 30 34	2266	80 17 24	2260	82 4 22	2254	83 51 29	2249
	Aldebaran W.	45 39 56	2111	47 30 39	2106	49 21 29	2102	51 12 26	2098
	Mars W.	30 59 24	2334	32 44 34	2317	34 30 8	2302	36 16 5	2289
	Regulus E.	34 28 57	2110	32 38 13	2106	30 47 23	2102	28 56 27	2098
	Jupiter E.	56 36 49	2075	54 45 12	2071	52 53 29	2066	51 1 38	2064
	Spica ♀ E.	88 15 36	2139	86 25 36	2135	84 35 30	2130	82 45 17	2127
24	α Arietis W.	92 48 21	2239	94 35 50	2240	96 23 18	2241	98 10 44	2244
	Aldebaran W.	60 28 14	2088	62 19 31	2088	64 10 48	2089	66 2 4	2090
	Mars W.	45 9 38	2250	46 56 51	2245	48 44 11	2243	50 31 34	2241
	Pollux W.	18 48 41	2690	20 25 34	2693	22 4 38	2520	23 45 24	2461
	Jupiter E.	41 41 22	2054	39 49 12	2053	37 57 1	2054	36 4 51	2055
	Spica ♀ E.	73 33 14	2120	71 42 45	2120	69 52 16	2121	68 1 49	2124
	Antares E.	119 15 55	2169	117 26 41	2166	115 37 23	2165	113 48 2	2163
25	α Arietis W.	107 6 29	2271	108 53 11	2279	110 39 41	2289	112 25 56	2300
	Aldebaran W.	75 17 42	2105	77 8 34	2109	78 59 19	2115	80 49 55	2121
	Mars W.	59 28 49	2245	61 16 9	2249	63 3 24	2253	64 50 33	2258
	Pollux W.	32 24 52	2310	34 10 37	2296	35 56 42	2286	37 43 2	2279
	Jupiter E.	26 44 49	2071	24 53 5	2075	23 1 28	2082	21 10 1	2088
	Spica ♀ E.	58 50 42	2144	57 0 50	2150	55 11 7	2153	53 21 36	2166
	Antares E.	104 41 18	2171	102 52 6	2174	101 3 0	2179	99 14 1	2184
26	Aldebaran W.	90 0 20	2161	91 49 47	2170	93 39 0	2181	95 27 57	2191
	Mars W.	73 44 3	2295	75 30 10	2304	77 16 4	2314	79 1 43	2325
	Pollux W.	46 36 25	2272	48 23 5	2276	50 9 40	2280	51 56 9	2286
	Regulus W.	9 51 32	2161	11 40 59	2171	13 30 11	2180	15 19 9	2191
	Spica ♀ E.	44 17 31	2221	42 29 35	2234	40 41 58	2250	38 54 45	2266
	Antares E.	90 11 30	2223	88 23 36	2232	86 35 56	2243	84 48 33	2254
27	Aldebaran W.	104 28 26	2252	106 15 36	2266	108 2 25	2281	109 48 53	2294
	Mars W.	87 45 46	2387	89 29 39	2401	91 13 12	2416	92 56 24	2431
	Pollux W.	60 45 53	2330	62 31 9	2342	64 16 8	2353	66 0 50	2366
	Regulus W.	24 19 38	2253	26 6 47	2266	27 53 37	2281	29 40 5	2294
	Spica ♀ E.	30 5 23	2373	28 21 9	2402	26 37 37	2434	24 54 50	2470
	Antares E.	75 55 58	2319	74 10 27	2333	72 25 16	2350	70 40 29	2365
28	Mars W.	101 26 51	2513	103 7 46	2530	104 48 17	2548	106 28 23	2566
	Pollux W.	74 39 36	2436	76 22 20	2452	77 4 41	2467	79 46 40	2483
	Regulus W.	38 27 0	2372	40 11 13	2389			38 33	2422
	Jupiter W.	16 57 33	2337	18 42 38	2353			40	238
	Antares E.	62 2 31	2453	60 20 12	2468				



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>b</sup> .	P. L. of diff.	XVIII <sup>b</sup> .	P. L. of diff.	XXI <sup>b</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
22	SUN W.	131 54 21	2442	133 36 56	2436	135 19 40	2429	137 2 33	2423
	Saturn W.	99 32 13	2169	101 21 27	2162	103 10 52	2156	105 0 26	2150
	α Arietis W.	71 25 16	2300	73 11 15	2290	74 57 29	2281	76 43 56	2274
	Aldebaran W.	38 18 31	2134	40 8 38	2128	41 58 55	2122	43 49 21	2116
	Mars W.	24 4 27	2438	25 47 8	2405	27 30 35	2377	29 14 43	2354
	Regulus E.	41 50 23	2134	40 0 16	2128	38 9 59	2121	36 19 32	2116
	Jupiter E.	64 1 49	2099	62 10 48	2093	60 19 38	2097	58 28 18	2081
	Spica η E.	95 34 11	2162	93 44 46	2156	91 55 12	2150	90 5 29	2143
23	Saturn W.	114 10 9	2130	116 0 23	2128	117 50 40	2126	119 41 0	2124
	α Arietis W.	85 38 43	2246	87 26 2	2243	89 13 26	2241	91 0 53	2240
	Aldebaran W.	53 3 28	2096	54 54 34	2092	56 45 45	2091	58 36 58	2089
	Mars W.	38 2 20	2278	39 48 51	2269	41 35 36	2262	43 22 32	2255
	Regulus E.	27 5 25	2095	25 14 18	2092	23 23 7	2091	21 31 54	2089
	Jupiter E.	49 9 43	2061	47 17 43	2057	45 25 38	2056	43 33 31	2055
	Spica η E.	80 54 59	2124	79 4 36	2122	77 14 11	2120	75 23 43	2120
24	α Arietis W.	99 58 6	2247	101 45 23	2251	103 32 34	2257	105 19 36	2264
	Aldebaran W.	67 53 19	2092	69 44 31	2094	71 35 39	2097	73 26 43	2100
	Mars W.	52 19 1	2239	54 6 30	2240	55 53 58	2241	57 41 24	2242
	Pollux W.	25 27 32	2416	27 10 44	2380	28 54 48	2351	30 39 34	2328
	Jupiter E.	34 12 43	2057	32 20 38	2060	30 28 37	2063	28 36 40	2066
	Spica η E.	66 11 26	2126	64 21 6	2129	62 30 51	2133	60 40 43	2138
	Antares E.	111 58 39	2163	110 9 16	2164	108 19 54	2165	106 30 34	2168
25	α Arietis W.	114 11 55	2312	115 57 37	2324	117 43 1	2339	119 28 3	2355
	Aldebaran W.	82 40 22	2128	84 30 39	2135	86 20 45	2143	88 10 39	2151
	Mars W.	66 37 34	2264	68 24 27	2270	70 11 10	2278	71 57 42	2285
	Pollux W.	39 29 33	2273	41 16 12	2270	43 2 55	2269	44 49 40	2269
	Jupiter E.	19 18 43	2096	17 27 37	2104	15 36 44	2113	13 46 4	2123
	Spica η E.	51 32 17	2175	49 43 12	2185	47 54 22	2196	46 5 48	2207
	Antares E.	97 25 10	2190	95 36 28	2198	93 47 57	2205	91 59 37	2214
26	Aldebaran W.	97 16 38	2202	99 5 2	2214	100 53 9	2227	102 40 57	2239
	Mars W.	80 47 6	2336	82 32 13	2348	84 17 2	2360	86 1 34	2374
	Pollux W.	53 42 29	2293	55 28 38	2300	57 14 37	2310	59 0 22	2320
	Regulus W.	17 7 50	2202	18 56 14	2214	20 44 21	2227	22 32 9	2239
	Spica η E.	37 7 55	2284	35 21 32	2303	33 35 37	2324	31 50 13	2348
	Antares E.	83 1 25	2266	81 14 35	2278	79 28 3	2291	77 41 51	2304
27	Aldebaran W.	111 35 1	2310	113 20 46	2324	115 6 10	2341	116 51 10	2356
	Mars W.	94 39 15	2447	96 21 43	2463	98 3 49	2479	99 45 31	2495
	Pollux W.	67 45 14	2378	69 29 20	2392	71 13 6	2406	72 56 32	2421
	Regulus W.	31 26 13	2310	33 11 58	2324	34 57 22	2340	36 42 23	2357
	Spica η E.	23 12 54	2512	21 31 57	2561	19 52 9	2620	18 13 41	2693
	Antares E.	68 56 4	2382	67 12 3	2399	65 28 27	2417	63 45 16	2435
28	Mars W.	108 8 5	2585	109 47 21	2603	111 26 12	2622	113 4 37	2641
	Pollux W.	81 28 17	2500	83 9 30	2517	84 50 20	2534	86 30 46	2551
	Regulus W.	45 21 36	2439	47 4 15	2456	48 46 30	2474	50 28 20	2491
	Jupiter W.	23 55 36	2402	25 39 8	2418	27 22 17	2436	29 5 1	2452
	Antares E.	55 16 1	2534	53 35 35	2555	51 55 38	2577	50 16 11	2598



## CONFIGURATIONS OF THE SATELLITES OF JUPITER,

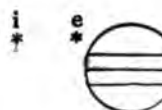
At 14<sup>h</sup>, MEAN TIME.

Day of the Month.	West.	East.
1	4 .1	○ 2 .3
2	4 .2	○ 1 .3
3		1 .4 ○ 3 .
4	1 . ○	○ 3 . 4
5	3 . 2 .	○ 1 . 4
6	.3 .2 1 .	○ .4
7	.3	○ 1 .2 .4
8	.1	○ 3 2 .4
9	2 .	○ 1 .3 4 .
10	.2 ●	.1 ○ 3 .4
11		○ 1 . 4 .2
12		3 .4 2 . ○
13	3 .4	.2 1 . ○
14	4 .3	○ 1 .2
15	4 .1	○ 2 .3
16	.4 2 .	○ 1 .3
17	.4 .1 2	○ 3 .
18	.4	○ 1 .3 2 .
19	.4 3 .	2 . ○
20	3 .2	○ 4 .1
21	.3	○ 1 .2 4
22	1 .3	○ 2 .4
23	2 .	○ 1 .3 4
24	.1 2	○ 3 .4
25		○ 1 . 3 .4
26	2 . ○	3 .1 ○ 4 .
27	1 . ○	3 .2 ○ 4 .
28	.3	○ 1 .2 ○ 4 .

This Table represents, at 14<sup>h</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the page; the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of the Satellites' motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite is *on the side of it is* Jupiter, and a black circle (●) that it is either *behind* Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

SATELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.	1	<sup>h</sup> 21 <sup>m</sup> 38 <sup>s</sup> 52.1	<sup>h</sup> 18 <sup>m</sup> 27 <sup>s</sup> 46.1	Im.
	3*	16 7 10.8	13 3 3.4	Im.
	5*	10 35 33.4	7 38 24.7	Im.
	7	5 3 53.1	2 13 42.9	Im.
	8	23 32 14.2	20 49 2.7	Im.
	10*	18 0 33.9	15 24 21.0	Im.
	12*	12 28 57.8	9 59 43.6	Im.
	14	6 57 18.7	4 33 3.1	Im.
	16	1 25 41.1	23 10 24.1	Im.
	17	19 54 2.2	17 45 43.8	Im.
	19*	14 22 27.3	12 21 7.6	Im.
	21*	8 50 49.9	6 56 28.8	Im.
	23	3 19 13.5	1 31 51.1	Im.
	24	21 47 36.2	20 7 12.4	Im.
	26*	16 16 2.6	14 42 37.4	Im.
	28*	10 44 27.1	9 18 0.5	Im.
II.	3*	9 45 32.2	6 40 22.2	Im.
	6	23 3 43.7	20 12 34.4	Im.
	10*	12 21 5.3	9 43 56.6	Im.
	14	1 39 25.1	23 16 17.3	Im.
	17*	14 56 52.3	12 47 45.1	Im.
	21	4 15 20.1	2 20 13.8	Im.
	24*	17 32 52.6	15 51 47.0	Im.
	28†	6 51 28.5	5 24 23.7	Im.
III.	1	2 57 23.0	23 43 12.7	Im.
	8	6 55 12.3	4 9 17.0	Im.
	15*	10 53 42.7	8 36 2.5	Im.
	22*	14 51 45.1	13 2 19.8	Im.
IV.	3*	10 10 43.5	7 5 37.6	Im.
	3*	13 55 37.4	10 51 8.4	Em.
	20	4 10 2.5	2 10 58.7	Im.
	20*	7 48 32.0	5 50 4.1	Em.





APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHADOWS.	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Egress.
	d h m	d h m	d h m	d h m	d h m	d h m
I.		2 21 30	1 21 51	1 0 8	1 21 3	1 23 21
		3† 16 3	2† 16 24	2 18 41	2* 15 38	2 17 57
		5* 10 36	4* 10 57	4* 13 15	4* 10 13	4* 12 32
	In	7† 5 10	6† 5 31	6* 7 48	6 4 49	6* 7 7
		9 23 43	8 0 4	8 2 21	8 23 24	8 1 43
		10 18 16	9 18 37	9 20 55	9 18 0	9 20 18
		12* 12 49	11* 13 11	11* 15 28	11* 12 35	11* 14 54
	the	14* 7 22	13* 7 44	13* 10 1	13* 7 11	13* 9 29
		16 1 55	15 2 17	15 4 34	15 1 46	15 4 4
		17 20 28	16 20 50	17 23 7	16 20 22	17 22 40
		19* 15 1	18* 15 23	18 17 40	18* 14 57	18 17 16
	Shadow.	21* 9 34	20* 9 56	20* 12 13	20* 9 33	20* 11 51
		23 4 7	22 4 29	22* 6 47	22 4 8	22* 6 26
		25 22 40	24 23 2	24 1 20	24 22 44	24 1 2
		26† 17 12	25 17 35	25 19 53	25 17 19	25 19 37
		28* 11 45	27* 12 8	27* 14 26	27* 11 55	27* 14 13
II.	In	3* 10 58	1* 13 52	1 16 39	1* 12 15	1* 15 6
		7 0 22	5 3 14	5* 6 2	5 1 46	5 4 37
		10* 13 45	8† 16 37	8 19 24	8* 15 17	8 18 8
	the	14 3 8	12* 5 58	12* 8 45	12 4 48	12* 7 38
		17† 16 30	15 19 20	16 22 7	15 18 18	15 21 9
		21* 5 53	19* 8 41	19* 11 28	19* 7 49	19* 10 40
	Shadow.	24 19 14	22 22 2	23 0 49	22 21 20	23 0 11
		28* 8 36	26* 11 22	26* 14 9	26* 10 51	26* 13 41
III.	In the	1* 6 10	4 16 40	4 19 55	4* 13 39	4 17 8
		8* 10 2	11 20 31	12 23 46	11 18 6	12 21 33
	Shadow.	15* 13 52	19 0 18	19 3 33	19 22 32	19 1 59
		22 17 39	26 4 4	26* 7 20	26 2 59	26* 6 25
IV.	3* 14 29	3 17 26	11 20 31	11 23 28	11* 14 42	11 18 39
	20* 6 11	20* 9 8	28* 11	28* 9 48	28* 9 48	28* 13 39

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>h</sup> 871790. Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	-1.1052	+1.1753	-8.9654	+0.8808	<sup>h</sup> 3 <sup>m</sup> 14 <sup>s</sup> 7.50	315	31	.085
2	1.1133	1.1680	8.9533	0.8794	3 10 11.59	316	32	.088
3	1.1212	1.1605	8.9410	0.8780	3 6 15.68	317	33	.090
4	-1.1287	+1.1527	-8.9286	+0.8766	3 2 19.77	318	34	.093
5	1.1360	1.1447	8.9160	0.8752	2 58 23.86	319	35	.096
6	1.1431	1.1363	8.9031	0.8738	2 54 27.96	320	36	.099
7	-1.1499	+1.1277	-8.8900	+0.8724	2 50 32.05	321	37	.101
8	1.1565	1.1187	8.8767	0.8710	2 46 36.14	322	38	.104
9	1.1628	1.1094	8.8631	0.8696	2 42 40.23	323	39	.107
10	-1.1689	+1.0998	-8.8494	+0.8682	2 38 44.32	324	40	.110
11	1.1748	1.0898	8.8353	0.8668	2 34 48.41	325	41	.112
12	1.1805	1.0795	8.8210	0.8654	2 30 52.51	326	42	.115
13	-1.1859	+1.0687	-8.8064	+0.8640	2 26 56.60	327	43	.118
14	1.1912	1.0576	8.7915	0.8626	2 23 0.69	328	44	.120
15	1.1963	1.0460	8.7763	0.8613	2 19 4.78	329	45	.123
16	-1.2011	+1.0340	-8.7607	+0.8599	2 15 8.88	330	46	.126
17	1.2058	1.0215	8.7447	0.8586	2 11 12.97	331	47	.129
18	1.2103	1.0085	8.7283	0.8572	2 7 17.06	332	48	.131
19	-1.2146	+0.9950	-8.7115	+0.8559	2 3 21.15	333	49	.134
20	1.2188	0.9809	8.6943	0.8546	1 59 25.25	334	50	.137
21	1.2227	0.9662	8.6766	0.8534	1 55 29.34	335	51	.140
22	-1.2265	+0.9509	-8.6583	+0.8521	1 51 33.43	336	52	.142
23	1.2301	0.9349	8.6395	0.8509	1 47 37.52	337	53	.145
24	1.2336	0.9181	8.6202	0.8497	1 43 41.62	338	54	.148
25	-1.2369	+0.9005	-8.6002	+0.8485	1 39 45.71	339	55	.151
26	1.2400	0.8821	8.5794	0.8474	1 35 49.81	340	56	.153
27	1.2430	0.8627	8.5579	0.8462	1 31 53.90	341	57	.156
28	1.2458	0.8423	8.5353	0.8451	1 27 57.99	342	58	.159
29	-1.2485	+0.8207	-8.5118	+0.8441	1 24 2.09	343	59	.162



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Frid.	1	22 48 22.78	9.345	S. 7 35 54.4	57.07	1 5 35	12 36.60	0.510
Sat.	2	22 52 7.07	9.325	7 13 4.8	57.33	1 5 28	12 24.37	0.530
Sun.	3	22 55 50.88	9.306	6 50 9.0	57.57	1 5 21	12 11.66	0.549
Mon.	4	22 59 34.23	9.288	6 27 7.4	57.79	1 5 14	11 58.49	0.567
Tues.	5	23 3 17.14	9.270	6 4 0.4	58.00	1 5 07	11 44.89	0.584
Wed.	6	23 6 59.63	9.254	5 40 48.3	58.20	1 5 01	11 30.87	0.601
Thur.	7	23 10 41.72	9.238	5 17 31.6	58.38	1 4 95	11 16.45	0.617
Frid.	8	23 14 23.44	9.223	4 54 10.6	58.54	1 4 89	11 1.65	0.632
Sat.	9	23 18 4.79	9.209	4 30 45.7	58.68	1 4 84	10 46.49	0.646
Sun.	10	23 21 45.80	9.195	4 7 17.3	58.81	1 4 79	10 30.99	0.659
Mon.	11	23 25 26.49	9.182	3 43 45.8	58.92	1 4 74	10 15.17	0.672
Tues.	12	23 29 6.86	9.170	3 20 11.7	59.02	1 4 69	9 59.03	0.685
Wed.	13	23 32 46.93	9.158	2 56 35.2	59.10	1 4 65	9 42.60	0.696
Thur.	14	23 36 26.73	9.147	2 32 56.7	59.17	1 4 61	9 25.89	0.707
Frid.	15	23 40 6.26	9.137	2 9 16.7	59.21	1 4 57	9 8.92	0.717
Sat.	16	23 43 45.55	9.128	1 45 35.6	59.24	1 4 54	8 51.71	0.727
Sun.	17	23 47 24.62	9.119	1 21 53.7	59.26	1 4 51	8 34.27	0.735
Mon.	18	23 51 3.48	9.111	0 58 11.4	59.26	1 4 49	8 16.62	0.743
Tues.	19	23 54 42.14	9.104	0 34 29.1	59.24	1 4 46	7 58.78	0.751
Wed.	20	23 58 20.63	9.097	S. 0 10 47.2	59.22	1 4 44	7 40.76	0.757
Thur.	21	0 1 58.96	9.092	N. 0 12 54.0	59.17	1 4 42	7 22.59	0.762
Frid.	22	0 5 37.17	9.087	0 36 34.1	59.11	1 4 41	7 4.30	0.767
Sat.	23	0 9 15.27	9.083	1 0 12.7	59.03	1 4 40	6 45.90	0.771
Sun.	24	0 12 53.27	9.081	1 23 49.5	58.94	1 4 39	6 27.40	0.773
Mon.	25	0 16 31.21	9.079	1 47 24.1	58.84	1 4 38	6 8.84	0.775
Tues.	26	0 20 9.12	9.078	2 10 56.3	58.72	1 4 38	5 50.25	0.776
Wed.	27	0 23 47.00	9.079	2 34 25.6	58.59	1 4 38	5 31.63	0.775
IV.	28	0 27 24.89	9.080	2 57 51.8	58.45	1 4 38	5 13.02	0.774
	29	0 31 2.81	9.082	3 21 14.5	58.28	1 4 38	4 54.43	0.772
	30	0 35 2.78	9.085	3 44 33.3	58.11	1 4 39	4 35.90	0.769
	31	0 39 1.3	9.090	4 7 48.0	57.93	1 4 40	4 17.45	0.765
		5.98		N. 4 30 58.2		1 4 42	3 59.10	

\*ameter passing may be found by subtracting 0.18 from the Sidereal Time.

## AT MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S			Equation of Time, to be subtracted from Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
Frid.	1	<sup>h</sup> 22 <sup>m</sup> 48 <sup>s</sup> 20·82	S. <sup>°</sup> 7 <sup>'</sup> 36 <sup>"</sup> 6·4	<sup>'</sup> 16 <sup>"</sup> 9·2	<sup>m</sup> 12 <sup>s</sup> 36·71	<sup>h</sup> 22 <sup>m</sup> 35 <sup>s</sup> 44·11
Sat.	2	22 52 5·14	7 13 16·6	16 8·9	12 24·48	22 39 40·66
Sun.	3	22 55 48·98	6 50 20·7	16 8·7	12 11·77	22 43 37·22
Mon.	4	22 59 32·37	6 27 18·9	16 8·4	11 58·61	22 47 33·77
Tues.	5	23 3 15·32	6 4 11·7	16 8·2	11 45·00	22 51 30·32
Wed.	6	23 6 57·85	5 40 59·5	16 7·9	11 30·98	22 55 26·87
Thur.	7	23 10 39·99	5 17 42·6	16 7·6	11 16·56	22 59 23·43
Frid.	8	23 14 21·74	4 54 21·4	16 7·4	11 1·76	23 3 19·98
Sat.	9	23 18 3·13	4 30 56·3	16 7·1	10 46·60	23 7 16·53
Sun.	10	23 21 44·19	4 7 27·6	16 6·8	10 31·11	23 11 13·08
Mon.	11	23 25 24·92	3 43 55·9	16 6·6	10 15·28	23 15 9·63
Tues.	12	23 29 5·33	3 20 21·5	16 6·3	9 59·14	23 19 6·19
Wed.	13	23 32 45·45	2 56 44·7	16 6·0	9 42·71	23 23 2·74
Thur.	14	23 36 25·29	2 33 6·0	16 5·8	9 26·00	23 26 59·29
Frid.	15	23 40 4·87	2 9 25·8	16 5·5	9 9·03	23 30 55·84
Sat.	16	23 43 44·21	1 45 44·4	16 5·2	8 51·81	23 34 52·39
Sun.	17	23 47 23·32	1 22 2·2	16 4·9	8 34·37	23 38 48·95
Mon.	18	23 51 2·22	0 58 19·6	16 4·7	8 16·72	23 42 45·50
Tues.	19	23 54 40·93	0 34 37·0	16 4·4	7 58·88	23 46 42·05
Wed.	20	23 58 19·46	S. 0 10 54·8	16 4·1	7 40·86	23 50 38·60
Thur.	21	0 1 57·84	N. 0 12 46·7	16 3·9	7 22·69	23 54 35·15
Frid.	22	0 5 36·10	0 36 27·1	16 3·6	7 4·39	23 58 31·71
Sat.	23	0 9 14·24	1 0 6·0	16 3·4	6 45·98	0 2 28·26
Sun.	24	0 12 52·29	1 23 43·1	16 3·1	6 27·48	0 6 24·81
Mon.	25	0 16 30·28	1 47 18·1	16 2·8	6 8·92	0 10 21·36
Tues.	26	0 20 8·23	2 10 50·6	16 2·6	5 50·32	0 14 17·91
Wed.	27	0 23 46·16	2 34 20·2	16 2·3	5 31·70	0 18 14·46
Thur.	28	0 27 24·10	2 57 46·7	16 2·0	5 13·09	0 22 11·02
Frid.	29	0 31 2·06	3 21 9·7	16 1·7	4 54·50	0 26 7·57
Sat.	30	0 34 40·08	3 44 28·8	16 1·5	4 35·96	0 30 4·12
Sun.	31	0 38 18·18	4 7 43·8	16 1·2	4 17·51	0 34 0·67
Mon.	32	0 41 56·37	N. 4 30 54·3	16 0·9	3 59·15	0 37 57·23

\* The Semidiameter for *Apparent* Noon may be assumed the same as that for *Mean* Noon.



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax.	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Midnight.
1	340° 35' 21"·5	N.0° 57'	9·9962791	15 44'·3	15 37'·1	57 45'·3	57 18'·8
2	341 35 28·5	0° 65'	9·9963910	15 29'·9	15 23'·0	56 52'·6	56 27'·0
3	342 35 33·8	0° 70'	9·9965044	15 16'·5	15 10'·4	56 3'·1	55 40'·9
4	343 35 37·5	0° 72'	9·9966192	15 4'·9	14 59'·9	55 20'·6	55 2'·4
5	344 35 39·6	0° 70'	9·9967351	14 55'·6	14 52'·0	54 46'·6	54 33'·5
6	345 35 40'·1	0° 66'	9·9968521	14 49'·1	14 46'·9	54 22'·9	54 14'·8
7	346 35 39'·0	0° 59'	9·9969698	14 45'·4	14 44'·6	54 9'·2	54 6'·2
8	347 35 36'·2	0° 49'	9·9970882	14 44'·5	14 45'·0	54 5'·7	54 7'·6
9	348 35 31'·8	0° 38'	9·9972072	14 46'·1	14 47'·7	54 11'·7	54 17'·7
10	349 35 25'·8	0° 25'	9·9973265	14 49'·9	14 52'·5	54 25'·5	54 35'·1
11	350 35 17'·9	N.0° 12'	9·9974461	14 55'·4	14 58'·7	54 46'·0	54 58'·0
12	351 35 8'·2	S.0° 01'	9·9975659	15 2'·2	15 6'·1	55 11'·0	55 24'·9
13	352 34 56'·5	0° 14'	9·9976857	15 10'·0	15 14'·0	55 39'·3	55 54'·2
14	353 34 42'·9	0° 25'	9·9978054	15 18'·1	15 22'·3	56 9'·3	56 24'·5
15	354 34 27'·2	0° 34'	9·9979252	15 26'·4	15 30'·5	56 39'·7	56 54'·7
16	355 34 9'·4	0° 40'	9·9980451	15 34'·5	15 38'·5	57 9'·5	57 23'·9
17	356 33 49'·4	0° 44'	9·9981650	15 42'·3	15 46'·0	57 37'·8	57 51'·5
18	357 33 27'·3	0° 44'	9·9982850	15 49'·6	15 53'·1	58 4'·8	58 17'·5
19	358 33 2'·8	0° 42'	9·9984051	15 56'·5	15 59'·7	58 29'·9	58 41'·8
20	359 32 35'·9	0° 37'	9·9985255	16 2'·8	16 5'·6	58 53'·1	59 3'·5
21	0 32 6'·7	0° 29'	9·9986461	16 8'·2	16 10'·5	59 13'·0	59 21'·6
22	1 31 35'·3	0° 18'	9·9987671	16 12'·5	16 14'·1	59 28'·9	59 34'·6
23	2 31 1'·6	S.0° 06'	9·9988887	16 15'·1	16 15'·6	59 38'·4	59 40'·2
24	3 30 25'·5	N.0° 07'	9·9990110	16 15'·5	16 14'·7	59 39'·7	59 37'·0
25	4 29 47'·2	0° 20'	9·9991339	16 13'·3	16 11'·0	59 31'·6	59 23'·4
26	5 29 6'·8	0° 33'	9·9992575	16 8'·1	16 4'·4	59 12'·5	58 59'·2
27	6 28 24'·1	0° 45'	9·9993818	16 0'·2	15 55'·4	58 43'·7	58 26'·2
28	7 27 39'·4	0° 55'	9·9995068	15 50'·2	15 44'·6	58 7'·0	57 46'·6
29	8 26 52'·6	0° 63'	9·9996325	15 38'·8	15 32'·9	57 25'·2	57 3'·4
30	9 26 3'·8	0° 69'	9·9997588	15 26'·9	15 21'·0	56 41'·4	56 19'·7
31	10 25 13'·2	0° 71'	9·9998856	15 15'·3	15 9'·9	55 58'·8	55 39'·0
32	11 24 20'·6	N.0° 70'	0·0000127	15 4'·9	15 0'·3	55 20'·6	55 4'·0

## MEAN TIME.

Day of the Week.	Day of the Month.	THE MOON'S							
		Longitude.		Latitude.		Age.		Meridian	
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.		
		<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>d</sup>	<sup>h</sup> <sup>m</sup>		
Frid.	1	199 49 29.8	206 31 58.3	N. 4 22 47.5	N. 4 41 28.1	17.2	15 13.8		
Sat.	2	213 8 18.2	219 38 37.0	4 56 5.0	5 6 38.0	18.2	16 1.6		
Sun.	3	226 3 9.4	232 22 16.1	5 13 10.0	5 15 47.5	19.2	16 49.0		
Mon.	4	238 36 21.7	244 45 55.7	5 14 38.0	5 9 50.7	20.2	17 36.3		
Tues.	5	250 51 30.2	256 53 39.8	5 1 36.3	4 50 5.4	21.2	18 23.8		
Wed.	6	262 53 0.2	268 50 8.4	4 35 29.9	4 18 1.0	22.2	19 11.5		
Thur.	7	274 45 40.9	280 40 14.9	3 57 51.0	3 35 12.5	23.2	19 59.2		
Frid.	8	286 34 26.2	292 28 49.7	3 10 18.5	2 43 21.7	24.2	20 46.7		
Sat.	9	298 23 58.7	304 20 24.5	2 14 37.1	1 44 20.1	25.2	21 33.9		
Sun.	10	310 18 35.9	316 19 0.1	1 12 46.4	N. 0 40 14.3	26.2	22 20.5		
Mon.	11	322 21 59.7	328 27 55.5	N. 0 7 2.3	S. 0 26 28.5	27.2	23 6.6		
Tues.	12	334 37 4.3	340 49 39.6	S. 0 59 57.0	1 32 59.3	28.2	23 52.5		
Wed.	13	347 5 50.9	353 25 45.0	2 5 11.3	2 36 8.1	29.2	δ		
Thur.	14	359 49 24.1	6 16 48.1	3 5 23.6	3 32 32.4	0.5	0 38.5		
Frid.	15	12 47 53.6	19 22 35.0	3 57 9.7	4 18 51.4	1.5	1 25.0		
Sat.	16	26 0 44.7	32 42 13.4	4 37 14.9	4 52 0.4	2.5	2 12.6		
Sun.	17	39 26 51.0	46 14 26.3	5 2 50.2	5 9 30.0	3.5	3 2.0		
Mon.	18	53 4 49.1	59 57 48.2	5 11 48.8	5 9 39.9	4.5	3 53.6		
Tues.	19	66 53 13.3	73 50 54.2	5 3 0.2	4 51 51.3	5.5	4 47.6		
Wed.	20	80 50 41.4	87 52 25.2	4 36 18.9	4 16 33.1	6.5	5 44.0		
Thur.	21	94 55 55.6	102 1 2.2	3 52 49.3	3 25 25.8	7.5	6 42.0		
Frid.	22	109 7 33.6	116 15 15.7	2 54 47.1	2 21 20.6	8.5	7 40.6		
Sat.	23	123 23 52.9	130 33 7.1	1 45 37.6	S. 1 8 12.9	9.5	8 38.6		
Sun.	24	137 42 36.0	144 51 55.3	S. 0 29 43.8	N. 0 9 11.1	10.5	9 35.1		
Mon.	25	152 0 37.3	159 8 11.2	N. 0 47 51.5	1 25 38.4	11.5	10 29.5		
Tues.	26	166 14 4.7	173 17 43.8	2 1 53.5	2 36 2.2	12.5	11 21.9		
Wed.	27	180 18 35.1	187 16 6.1	3 7 32.4	3 35 56.9	13.5	12 12.6		
Thur.	28	194 9 46.6	200 59 9.8	4 0 53.6	4 22 5.6	14.5	13 2.0		
Frid.	29	207 43 54.4	214 23 43.4	4 39 21.5	4 52 34.2	15.5	13 50.7		
Sat.	30	220 58 27.0	227 28 1.2	5 1 42.7	5 6 48.6	16.5	14 39.0		
Sun.	31	233 52 28.4	240 11 58.0	5 7 57.6	5 5 18.8	17.5	15 27.3		
Mon.	32	246 26 44.6	252 37 8.7	N. 4 59 2.2	N. 4 49 19.4	18.5	16 15.6		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. D. for 10 <sup>m</sup> .
FRIDAY 1.				SUNDAY 3.			
0	13 19 49 <sup>80</sup>	S. 3 42 3 <sup>5</sup>	110 <sup>30</sup>	0	15 0 28 <sup>11</sup>	S. 11 39 4 <sup>2</sup>	85 <sup>34</sup>
1	13 21 57 <sup>54</sup>	3 53 5 <sup>3</sup>	109 <sup>95</sup>	1	15 2 32 <sup>68</sup>	11 47 36 <sup>5</sup>	84 <sup>71</sup>
2	13 24 5 <sup>16</sup>	4 4 5 <sup>0</sup>	109 <sup>60</sup>	2	15 4 37 <sup>22</sup>	11 56 4 <sup>8</sup>	84 <sup>02</sup>
3	13 26 12 <sup>67</sup>	4 15 2 <sup>6</sup>	109 <sup>23</sup>	3	15 6 41 <sup>75</sup>	12 4 29 <sup>1</sup>	83 <sup>31</sup>
4	13 28 20 <sup>06</sup>	4 25 58 <sup>0</sup>	108 <sup>85</sup>	4	15 8 46 <sup>25</sup>	12 12 49 <sup>4</sup>	82 <sup>54</sup>
5	13 30 27 <sup>35</sup>	4 36 51 <sup>1</sup>	108 <sup>48</sup>	5	15 10 50 <sup>75</sup>	12 21 5 <sup>5</sup>	82 <sup>02</sup>
6	13 32 34 <sup>53</sup>	4 47 42 <sup>0</sup>	108 <sup>08</sup>	6	15 12 55 <sup>22</sup>	12 29 17 <sup>6</sup>	81 <sup>31</sup>
7	13 34 41 <sup>60</sup>	4 58 30 <sup>5</sup>	107 <sup>68</sup>	7	15 14 59 <sup>68</sup>	12 37 25 <sup>5</sup>	80 <sup>51</sup>
8	13 36 48 <sup>58</sup>	5 9 16 <sup>6</sup>	107 <sup>28</sup>	8	15 17 4 <sup>13</sup>	12 45 29 <sup>2</sup>	79 <sup>93</sup>
9	13 38 55 <sup>45</sup>	5 20 0 <sup>3</sup>	106 <sup>87</sup>	9	15 19 8 <sup>57</sup>	12 53 28 <sup>8</sup>	79 <sup>23</sup>
10	13 41 2 <sup>22</sup>	5 30 41 <sup>5</sup>	106 <sup>45</sup>	10	15 21 13 <sup>00</sup>	13 1 24 <sup>1</sup>	78 <sup>53</sup>
11	13 43 8 <sup>90</sup>	5 41 20 <sup>2</sup>	106 <sup>02</sup>	11	15 23 17 <sup>42</sup>	13 9 15 <sup>3</sup>	77 <sup>94</sup>
12	13 45 15 <sup>48</sup>	5 51 56 <sup>3</sup>	105 <sup>58</sup>	12	15 25 21 <sup>83</sup>	13 17 2 <sup>1</sup>	77 <sup>04</sup>
13	13 47 21 <sup>97</sup>	6 2 29 <sup>8</sup>	105 <sup>13</sup>	13	15 27 26 <sup>23</sup>	13 24 44 <sup>6</sup>	76 <sup>33</sup>
14	13 49 28 <sup>38</sup>	6 13 0 <sup>6</sup>	104 <sup>68</sup>	14	15 29 30 <sup>63</sup>	13 32 22 <sup>9</sup>	75 <sup>51</sup>
15	13 51 34 <sup>70</sup>	6 23 28 <sup>7</sup>	104 <sup>22</sup>	15	15 31 35 <sup>03</sup>	13 39 56 <sup>8</sup>	74 <sup>92</sup>
16	13 53 40 <sup>93</sup>	6 33 54 <sup>0</sup>	103 <sup>75</sup>	16	15 33 39 <sup>42</sup>	13 47 26 <sup>3</sup>	74 <sup>20</sup>
17	13 55 47 <sup>09</sup>	6 44 16 <sup>5</sup>	103 <sup>28</sup>	17	15 35 43 <sup>81</sup>	13 54 51 <sup>5</sup>	73 <sup>45</sup>
18	13 57 53 <sup>16</sup>	6 54 36 <sup>2</sup>	102 <sup>78</sup>	18	15 37 48 <sup>20</sup>	14 2 12 <sup>2</sup>	72 <sup>74</sup>
19	13 59 59 <sup>15</sup>	7 4 52 <sup>9</sup>	102 <sup>32</sup>	19	15 39 52 <sup>59</sup>	14 9 28 <sup>5</sup>	71 <sup>98</sup>
20	14 2 5 <sup>07</sup>	7 15 6 <sup>8</sup>	101 <sup>80</sup>	20	15 41 56 <sup>99</sup>	14 16 40 <sup>4</sup>	71 <sup>23</sup>
21	14 4 10 <sup>91</sup>	7 25 17 <sup>6</sup>	101 <sup>32</sup>	21	15 44 1 <sup>38</sup>	14 23 47 <sup>7</sup>	70 <sup>41</sup>
22	14 6 16 <sup>69</sup>	7 35 25 <sup>5</sup>	100 <sup>78</sup>	22	15 46 5 <sup>78</sup>	14 30 50 <sup>6</sup>	69 <sup>73</sup>
23	14 8 22 <sup>39</sup>	S. 7 45 30 <sup>2</sup>	100 <sup>28</sup>	23	15 48 10 <sup>18</sup>	S. 14 37 49 <sup>0</sup>	68 <sup>91</sup>
SATURDAY 2.				MONDAY 4.			
0	14 10 28 <sup>03</sup>	S. 7 55 31 <sup>9</sup>	99 <sup>75</sup>	0	15 50 14 <sup>58</sup>	S. 14 44 42 <sup>8</sup>	68 <sup>21</sup>
1	14 12 33 <sup>60</sup>	8 5 30 <sup>4</sup>	99 <sup>22</sup>	1	15 52 18 <sup>99</sup>	14 51 32 <sup>1</sup>	67 <sup>41</sup>
2	14 14 39 <sup>11</sup>	8 15 25 <sup>7</sup>	98 <sup>70</sup>	2	15 54 23 <sup>41</sup>	14 58 16 <sup>8</sup>	66 <sup>16</sup>
3	14 16 44 <sup>56</sup>	8 25 17 <sup>9</sup>	98 <sup>13</sup>	3	15 56 27 <sup>84</sup>	15 4 56 <sup>8</sup>	65 <sup>91</sup>
4	14 18 49 <sup>95</sup>	8 35 6 <sup>7</sup>	97 <sup>60</sup>	4	15 58 32 <sup>27</sup>	15 11 32 <sup>3</sup>	65 <sup>11</sup>
5	14 20 55 <sup>28</sup>	8 44 52 <sup>3</sup>	97 <sup>03</sup>	5	16 0 36 <sup>72</sup>	15 18 3 <sup>1</sup>	64 <sup>31</sup>
6	14 23 0 <sup>55</sup>	8 54 34 <sup>5</sup>	96 <sup>47</sup>	6	16 2 41 <sup>17</sup>	15 24 29 <sup>2</sup>	63 <sup>51</sup>
7	14 25 5 <sup>77</sup>	9 4 13 <sup>3</sup>	95 <sup>92</sup>	7	16 4 45 <sup>63</sup>	15 30 50 <sup>7</sup>	62 <sup>71</sup>
8	14 27 10 <sup>94</sup>	9 13 48 <sup>8</sup>	95 <sup>32</sup>	8	16 6 50 <sup>11</sup>	15 37 7 <sup>4</sup>	62 <sup>01</sup>
9	14 29 16 <sup>06</sup>	9 23 20 <sup>7</sup>	94 <sup>77</sup>	9	16 8 54 <sup>60</sup>	15 43 19 <sup>4</sup>	61 <sup>21</sup>
10	14 31 21 <sup>14</sup>	9 32 49 <sup>3</sup>	94 <sup>12</sup>	10	16 10 59 <sup>09</sup>	15 49 26 <sup>7</sup>	60 <sup>41</sup>
11	14 33 26 <sup>16</sup>	9 42 14 <sup>2</sup>	93 <sup>58</sup>	11	16 13 3 <sup>61</sup>	15 55 29 <sup>2</sup>	59 <sup>61</sup>
12	14 35 31 <sup>14</sup>	9 51 35 <sup>7</sup>	92 <sup>98</sup>	12	16 15 8 <sup>13</sup>	16 1 26 <sup>9</sup>	58 <sup>81</sup>
13	14 37 36 <sup>08</sup>	10 0 53 <sup>6</sup>	92 <sup>37</sup>	13	16 17 12 <sup>67</sup>	16 7 19 <sup>8</sup>	58 <sup>01</sup>
14	14 39 40 <sup>98</sup>	10 10 7 <sup>8</sup>	91 <sup>77</sup>	14	16 19 17 <sup>22</sup>	16 13 7 <sup>8</sup>	57 <sup>21</sup>
15	14 41 45 <sup>84</sup>	10 19 18 <sup>4</sup>	91 <sup>17</sup>	15	16 21 21 <sup>79</sup>	16 18 51 <sup>1</sup>	56 <sup>41</sup>
16	14 43 50 <sup>66</sup>	10 28 25 <sup>4</sup>	90 <sup>53</sup>	16	16 23 26 <sup>38</sup>	16 24 29 <sup>5</sup>	55 <sup>51</sup>
17	14 45 55 <sup>45</sup>	10 37 28 <sup>6</sup>	89 <sup>90</sup>	17	16 25 30 <sup>98</sup>	16 30 3 <sup>0</sup>	54 <sup>77</sup>
18	14 48 0 <sup>20</sup>	10 46 28 <sup>0</sup>	89 <sup>28</sup>	18	16 27 35 <sup>59</sup>	16 35 31 <sup>6</sup>	53 <sup>98</sup>
19	14 50 4 <sup>93</sup>	10 55 23 <sup>7</sup>	88 <sup>65</sup>	19	16 29 40 <sup>23</sup>	16 40 53 <sup>3</sup>	53 <sup>13</sup>
20	14 52 9 <sup>62</sup>	11 4 15 <sup>6</sup>	88 <sup>00</sup>	20	16 31 44 <sup>88</sup>	16 46 14 <sup>1</sup>	52 <sup>32</sup>
21	14 54 14 <sup>28</sup>	11 13 3 <sup>6</sup>	87 <sup>35</sup>	21	16 33 49 <sup>54</sup>	16 51 28 <sup>0</sup>	51 <sup>48</sup>
22	14 56 18 <sup>92</sup>	11 21 47 <sup>7</sup>	86 <sup>70</sup>	22	16 35 54 <sup>23</sup>	16 56 36 <sup>9</sup>	50 <sup>67</sup>
23	14 58 23 <sup>53</sup>	11 30 27 <sup>9</sup>	86 <sup>05</sup>	23	16 37 58 <sup>93</sup>	17 1 40 <sup>9</sup>	49 <sup>83</sup>
24	15 0 28 <sup>11</sup>	S. 11 39 4 <sup>2</sup>		24	16 40 3 <sup>64</sup>	S. 17 6 39 <sup>9</sup>	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 5.				THURSDAY 7.			
0	h m s 16 40 3 64	S. 17 6 39 9	49 00	0	h m s 18 20 8 85	S. 19 24 34 2	7 07
1	16 42 8 38	17 11 33 9	48 18	1	18 22 14 19	19 25 16 6	6 18
2	16 44 13 14	17 16 23 0	47 33	2	18 24 19 52	19 25 53 7	5 27
3	16 46 17 91	17 21 7 0	46 48	3	18 26 24 85	19 26 25 3	4 38
4	16 48 22 70	17 25 45 9	45 67	4	18 28 30 18	19 26 51 6	3 47
5	16 50 27 52	17 30 19 9	44 82	5	18 30 35 51	19 27 12 4	2 58
6	16 52 32 35	17 34 48 8	43 97	6	18 32 40 83	19 27 27 9	1 68
7	16 54 37 20	17 39 12 6	43 12	7	18 34 46 15	19 27 38 0	0 78
8	16 56 42 06	17 43 31 3	42 27	8	18 36 51 46	19 27 42 7	0 10
9	16 58 46 95	17 47 44 9	41 42	9	18 38 56 76	19 27 42 1	1 02
10	17 0 51 85	17 51 53 4	40 55	10	18 41 2 06	19 27 36 0	1 90
11	17 2 56 77	17 55 56 7	39 72	11	18 43 7 34	19 27 24 6	2 82
12	17 5 1 71	17 59 55 0	38 85	12	18 45 12 62	19 27 7 7	3 70
13	17 7 6 67	18 3 48 1	37 98	13	18 47 17 89	19 26 45 5	4 60
14	17 9 11 64	18 7 36 0	37 12	14	18 49 23 14	19 26 17 9	5 50
15	17 11 16 64	18 11 18 7	36 27	15	18 51 28 39	19 25 44 9	6 40
16	17 13 21 64	18 14 56 3	35 40	16	18 53 33 62	19 25 6 5	7 28
17	17 15 26 67	18 18 28 7	34 52	17	18 55 38 83	19 24 22 8	8 18
18	17 17 31 72	18 21 55 8	33 67	18	18 57 44 03	19 23 33 7	9 08
19	17 19 36 78	18 25 17 8	32 78	19	18 59 49 22	19 22 39 2	9 97
20	17 21 41 86	18 28 34 5	31 92	20	19 1 54 39	19 21 39 4	10 85
21	17 23 46 95	18 31 46 0	31 05	21	19 3 59 54	19 20 34 3	11 75
22	17 25 52 06	18 34 52 3	30 17	22	19 6 4 67	19 19 23 8	12 65
23	17 27 57 18	S. 18 37 53 3	29 30	23	19 8 9 79	S. 19 18 7 9	13 53
WEDNESDAY 6.				FRIDAY 8.			
0	h m s 17 30 2 32	S. 18 40 49 1	28 42	0	h m s 19 10 14 88	S. 19 16 46 7	14 42
1	17 32 7 48	18 43 39 6	27 55	1	19 12 19 95	19 15 20 2	15 30
2	17 34 12 65	18 46 24 9	26 67	2	19 14 25 00	19 13 48 4	16 20
3	17 36 17 83	18 49 4 9	25 78	3	19 16 30 03	19 12 11 2	17 07
4	17 38 23 03	18 51 39 6	24 90	4	19 18 35 04	19 10 28 8	17 97
5	17 40 28 24	18 54 9 0	24 02	5	19 20 40 02	19 8 41 0	18 85
6	17 42 33 46	18 56 33 1	23 13	6	19 22 44 97	19 6 47 9	19 72
7	17 44 38 70	18 58 51 9	22 25	7	19 24 49 90	19 4 49 6	20 62
8	17 46 43 94	19 1 5 4	21 37	8	19 26 54 81	19 2 45 9	21 48
9	17 48 49 20	19 3 13 6	20 47	9	19 28 59 69	19 0 37 0	22 37
10	17 50 54 47	19 5 16 4	19 58	10	19 31 4 54	18 58 22 8	23 25
11	17 52 59 74	19 7 13 9	18 70	11	19 33 9 36	18 56 3 3	24 12
12	17 55 5 02	19 9 6 1	17 80	12	19 35 14 15	18 53 38 6	25 00
13	17 57 10 31	19 10 52 9	16 92	13	19 37 18 92	18 51 8 6	25 87
14	17 59 15 61	19 12 34 4	16 02	14	19 39 23 65	18 48 33 4	26 73
15	18 1 20 91	19 14 10 5	15 13	15	19 41 28 35	18 45 53 0	27 62
16	18 3 26 22	19 15 41 3	14 23	16	19 43 33 01	18 43 7 3	28 47
17	18 5 31 54	19 17 6 7	13 35	17	19 45 37 64	18 40 16 5	29 35
18	18 7 36 86	19 18 26 8	12 43	18	19 47 42 23	18 37 20 4	30 22
19	18 9 42 19	19 19 41 4	11 55	19	19 49 46 79	18 34 19 1	31 07
20	18 11 47 52	19 20 50 7	10 67	20	19 51 51 31	18 31 12 7	31 93
21	18 13 52 85	19 21 54 7	9 75	21	19 53 55 79	18 28 1 1	32 78
22	18 15 58 18	19 22 53 2	8 87	22	19 56 0 23	18 24 44 4	33 65
23	18 18 3 52	19 23 46 4	7 97	23	19 58 4 64	18 21 22 5	34 50
24	18 20 8 85	S. 19 24 34 2		24	20 0 9 00	S. 18 17 55 5	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 9.				MONDAY 11.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	20 0 9.00	S.18 17 55.5	35.35	0	21 38 45.21	S.13 57 22.2	72.65
1	20 2 13.33	18 14 23.4	36.22	1	21 40 47.29	13 50 6.3	73.33
2	20 4 17.62	18 10 46.1	37.05	2	21 42 49.33	13 42 46.3	74.00
3	20 6 21.88	18 7 3.8	37.88	3	21 44 51.32	13 35 22.3	74.68
4	20 8 26.09	18 3 16.5	38.75	4	21 46 53.27	13 27 54.2	75.33
5	20 10 30.25	17 59 24.0	39.68	5	21 48 55.18	13 20 22.2	76.00
6	20 12 34.38	17 55 26.5	40.42	6	21 50 57.04	13 12 46.2	76.67
7	20 14 38.46	17 51 24.0	41.25	7	21 52 58.86	13 5 6.2	77.32
8	20 16 42.50	17 47 16.5	42.08	8	21 55 0.64	12 57 22.3	77.95
9	20 18 46.50	17 43 4.0	42.92	9	21 57 2.38	12 49 34.6	78.60
10	20 20 50.45	17 38 46.5	43.73	10	21 59 4.08	12 41 43.0	79.22
11	20 22 54.36	17 34 24.1	44.57	11	22 1 5.74	12 33 47.7	79.87
12	20 24 58.21	17 29 56.7	45.38	12	22 3 7.36	12 25 48.5	80.48
13	20 27 2.03	17 25 24.4	46.20	13	22 5 8.95	12 17 45.6	81.10
14	20 29 5.79	17 20 47.2	47.02	14	22 7 10.50	12 9 39.0	81.70
15	20 31 9.52	17 16 5.1	47.83	15	22 9 12.02	12 1 28.8	82.33
16	20 33 13.19	17 11 18.1	48.63	16	22 11 13.50	11 53 14.8	82.92
17	20 35 16.82	17 6 26.3	49.45	17	22 13 14.94	11 44 57.3	83.52
18	20 37 20.40	17 1 29.6	50.25	18	22 15 16.34	11 36 36.2	84.12
19	20 39 23.94	16 56 28.1	51.05	19	22 17 17.72	11 28 11.5	84.70
20	20 41 27.42	16 51 21.8	51.85	20	22 19 19.06	11 19 43.3	85.27
21	20 43 30.86	16 46 10.7	52.65	21	22 21 20.36	11 11 11.7	85.87
22	20 45 34.25	16 40 54.8	53.43	22	22 23 21.64	11 2 36.5	86.42
23	20 47 37.59	S.16 35 34.2	54.22	23	22 25 22.88	S.10 53 58.0	86.98
SUNDAY 10.				TUESDAY 12.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	20 49 40.88	S.16 30 8.9	55.00	0	22 27 24.10	S.10 45 16.1	87.55
1	20 51 44.12	16 24 38.9	55.80	1	22 29 25.30	10 36 30.8	88.08
2	20 53 47.32	16 19 4.1	56.57	2	22 31 26.47	10 27 42.3	88.66
3	20 55 50.47	16 13 24.7	57.33	3	22 33 27.61	10 18 50.4	89.17
4	20 57 53.57	16 7 40.7	58.12	4	22 35 28.74	10 9 55.4	89.72
5	20 59 56.62	16 1 52.0	58.87	5	22 37 29.84	10 0 57.1	90.23
6	21 1 59.62	15 55 58.8	59.63	6	22 39 30.92	9 51 55.7	90.77
7	21 4 2.57	15 50 1.0	60.40	7	22 41 31.97	9 42 51.1	91.27
8	21 6 5.47	15 43 58.6	61.15	8	22 43 33.01	9 33 43.5	91.78
9	21 8 8.32	15 37 51.7	61.90	9	22 45 34.04	9 24 32.8	92.28
10	21 10 11.12	15 31 40.3	62.65	10	22 47 35.04	9 15 19.1	92.78
11	21 12 13.87	15 25 24.4	63.38	11	22 49 36.03	9 6 2.4	93.27
12	21 14 16.57	15 19 4.1	64.12	12	22 51 37.01	8 56 42.8	93.75
13	21 16 19.22	15 12 39.4	64.87	13	22 53 37.98	8 47 20.3	94.22
14	21 18 21.82	15 6 10.2	65.58	14	22 55 38.93	8 37 55.0	94.70
15	21 20 24.38	14 59 36.7	66.32	15	22 57 39.88	8 28 26.8	95.15
16	21 22 26.88	14 52 58.8	67.03	16	22 59 40.82	8 18 55.9	95.60
17	21 24 29.34	14 46 16.6	67.75	17	23 1 41.75	8 9 22.3	96.07
18	21 26 31.75	14 39 30.1	68.47	18	23 3 42.67	7 59 45.9	96.48
19	21 28 34.11	14 32 39.3	69.17	19	23 5 43.60	7 50 7.0	96.93
20	21 30 36.42	14 25 44.3	69.88	20	23 7 44.52	7 40 25.1	97.37
21	21 32 38.69	14 18 45.0	70.57	21	23 9 45.45	7 30 41.2	97.78
22	21 34 40.91	14 11 41.6	71.27	22	23 11 46.37	7 20 54.5	98.20
23	21 36 43.08	14 4 34.0	71.97	23	23 13 47.30	7 11 5.3	98.60
24	21 38 45.21	S.13 57 22.2		24	23 15 48.23	S. 7 1 13.7	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
<i>WEDNESDAY 13.</i>				<i>FRIDAY 15.</i>			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	23 15 48.23	S. 7 1 13.7	99.00	0	0 53 14.67	N. 1 25 1.8	109.00
1	23 17 49.17	6 51 19.7	99.40	1	0 55 18.17	1 35 55.8	109.00
2	23 19 50.12	6 41 23.3	99.78	2	0 57 21.78	1 46 49.8	108.98
3	23 21 51.08	6 31 24.6	100.15	3	0 59 25.49	1 57 43.7	108.97
4	23 23 52.05	6 21 23.7	100.53	4	1 1 29.31	2 8 37.5	108.95
5	23 25 53.03	6 11 20.5	100.90	5	1 3 33.25	2 19 31.2	108.90
6	23 27 54.03	6 1 15.1	101.25	6	1 5 37.30	2 30 24.6	108.85
7	23 29 55.04	5 51 7.6	101.58	7	1 7 41.47	2 41 17.7	108.80
8	23 31 56.07	5 40 58.1	101.95	8	1 9 45.76	2 52 10.5	108.73
9	23 33 57.13	5 30 46.4	102.27	9	1 11 50.18	3 3 2.9	108.67
10	23 35 58.20	5 20 32.8	102.62	10	1 13 54.71	3 13 54.9	108.57
11	23 37 59.30	5 10 17.1	102.92	11	1 15 59.38	3 24 46.3	108.48
12	23 40 0.42	4 59 59.6	103.23	12	1 18 4.16	3 35 37.2	108.38
13	23 42 1.56	4 49 40.2	103.53	13	1 20 9.09	3 46 27.5	108.27
14	23 44 2.74	4 39 19.0	103.83	14	1 22 14.15	3 57 17.1	108.13
15	23 46 3.94	4 28 56.0	104.13	15	1 24 19.35	4 8 5.9	108.02
16	23 48 5.18	4 18 31.2	104.40	16	1 26 24.68	4 18 54.0	107.87
17	23 50 6.46	4 8 4.8	104.67	17	1 28 30.16	4 29 41.2	107.72
18	23 52 7.77	3 57 36.8	104.95	18	1 30 35.78	4 40 27.5	107.55
19	23 54 9.12	3 47 7.1	105.20	19	1 32 41.54	4 51 12.8	107.38
20	23 56 10.51	3 36 35.9	105.45	20	1 34 47.45	5 1 57.1	107.20
21	23 58 11.95	3 26 3.2	105.68	21	1 36 53.51	5 12 40.3	107.02
22	0 0 13.43	3 15 29.1	105.92	22	1 38 59.72	5 23 22.4	106.80
23	0 2 14.95	S. 3 4 53.6	106.15	23	1 41 6.08	N. 5 34 3.2	106.60
<i>THURSDAY 14.</i>				<i>SATURDAY 16.</i>			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	0 4 16.53	S. 2 54 16.7	106.37	0	1 43 12.60	N. 5 44 42.8	106.37
1	0 6 18.16	2 43 38.5	106.57	1	1 45 19.27	5 55 21.0	106.15
2	0 8 19.85	2 32 59.1	106.78	2	1 47 26.10	6 5 57.9	105.88
3	0 10 21.59	2 22 18.4	106.97	3	1 49 33.10	6 16 33.2	105.65
4	0 12 23.38	2 11 36.6	107.15	4	1 51 40.26	6 27 7.1	105.38
5	0 14 25.24	2 0 53.7	107.32	5	1 53 47.58	6 37 39.4	105.12
6	0 16 27.16	1 50 9.8	107.50	6	1 55 55.08	6 48 10.1	104.83
7	0 18 29.14	1 39 24.8	107.65	7	1 58 2.74	6 58 39.1	104.53
8	0 20 31.19	1 28 38.9	107.80	8	2 0 10.58	7 9 6.3	104.23
9	0 22 33.30	1 17 52.1	107.93	9	2 2 18.59	7 19 31.7	103.92
10	0 24 35.49	1 7 4.5	108.07	10	2 4 26.78	7 29 55.2	103.60
11	0 26 37.75	0 56 16.1	108.20	11	2 6 35.15	7 40 16.8	103.27
12	0 28 40.08	0 45 26.9	108.32	12	2 8 43.70	7 50 36.4	102.92
13	0 30 42.49	0 34 37.0	108.42	13	2 10 52.44	8 0 53.9	102.58
14	0 32 44.98	0 23 46.5	108.50	14	2 13 1.35	8 11 9.4	102.20
15	0 34 47.55	0 12 55.5	108.60	15	2 15 10.46	8 21 22.6	101.83
16	0 36 50.20	S. 0 2 3.9	108.68	16	2 17 19.75	8 31 33.6	101.45
17	0 38 52.93	N. 0 8 48.2	108.75	17	2 19 29.24	8 41 42.3	101.05
18	0 40 55.76	0 19 40.7	108.82	18	2 21 38.92	8 51 48.6	100.65
19	0 42 58.67	0 30 33.6	108.87	19	2 23 48.79	9 1 52.5	100.23
20	0 45 1.68	0 41 26.8	108.92	20	2 25 58.86	9 11 53.9	99.80
21	0 47 4.78	0 52 20.3	108.95	21	2 28 9.13	9 21 52.7	99.37
22	0 49 7.97	1 3 14.0	108.97	22	2 30 19.59	9 31 48.9	98.92
23	0 51 11.27	1 14 7.8	109.00	23	2 32 30.26	9 41 42.4	98.47
24	0 53 14.67	N. 1 25 1.8		24	2 34 41.12	N. 9 51 33.2	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. D. for 10 <sup>m</sup> .
SUNDAY 17.				TUESDAY 19.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	2 34 41.12	N. 9 51 33.2	98.00	0	4 23 43.91	N. 16 29 43.0	63.20
1	2 36 52.19	10 1 21.2	97.52	1	4 26 5.85	16 36 2.2	62.23
2	2 39 3.47	10 11 6.3	97.02	2	4 28 28.01	16 42 15.6	61.23
3	2 41 14.96	10 20 48.4	96.53	3	4 30 50.39	16 48 23.0	60.23
4	2 43 26.65	10 30 27.6	96.02	4	4 33 13.00	16 54 24.5	59.27
5	2 45 38.56	10 40 3.7	95.48	5	4 35 35.82	17 0 20.1	58.23
6	2 47 50.67	10 49 36.6	94.97	6	4 37 58.86	17 6 9.5	57.23
7	2 50 3.01	10 59 6.4	94.43	7	4 40 22.12	17 11 52.9	56.18
8	2 52 15.56	11 8 33.0	93.87	8	4 42 45.60	17 17 30.0	55.17
9	2 54 28.32	11 17 56.2	93.30	9	4 45 9.29	17 23 1.0	54.12
10	2 56 41.30	11 27 16.0	92.73	10	4 47 33.19	17 28 25.7	53.07
11	2 58 54.51	11 36 32.4	92.15	11	4 49 57.30	17 33 44.1	52.00
12	3 1 7.93	11 45 45.3	91.55	12	4 52 21.61	17 38 56.1	50.93
13	3 3 21.57	11 54 54.6	90.95	13	4 54 46.14	17 44 1.7	49.85
14	3 5 35.44	12 4 0.3	90.33	14	4 57 10.87	17 49 0.8	48.77
15	3 7 49.53	12 13 2.3	89.72	15	4 59 35.80	17 53 53.4	47.67
16	3 10 3.85	12 22 0.6	89.07	16	5 2 0.93	17 58 39.4	46.57
17	3 12 18.39	12 30 55.0	88.42	17	5 4 26.25	18 3 18.8	45.45
18	3 14 33.16	12 39 45.5	87.77	18	5 6 51.77	18 7 51.5	44.33
19	3 16 48.16	12 48 32.1	87.08	19	5 9 17.49	18 12 17.6	43.20
20	3 19 3.38	12 57 14.6	86.42	20	5 11 43.39	18 16 36.8	42.08
21	3 21 18.84	13 5 53.1	85.73	21	5 14 9.48	18 20 49.3	40.93
22	3 23 34.52	13 14 27.5	85.02	22	5 16 35.75	18 24 54.9	39.76
23	3 25 50.43	N. 13 22 57.6	84.32	23	5 19 2.21	N. 18 28 53.7	38.63
MONDAY 18.				WEDNESDAY 20.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	3 28 6.58	N. 13 31 23.5	83.58	0	5 21 28.84	N. 18 32 45.5	37.48
1	3 30 22.96	13 39 45.0	82.87	1	5 23 55.65	18 36 30.4	36.30
2	3 32 39.56	13 48 2.2	82.12	2	5 26 22.63	18 40 3.2	35.12
3	3 34 56.41	13 56 14.9	81.37	3	5 28 49.78	18 43 39.0	33.95
4	3 37 13.48	14 4 23.1	80.58	4	5 31 17.10	18 47 2.7	32.78
5	3 39 30.79	14 12 26.6	79.83	5	5 33 44.58	18 50 19.2	31.57
6	3 41 48.33	14 20 25.6	79.03	6	5 36 12.22	18 53 28.6	30.37
7	3 44 6.10	14 28 19.8	78.25	7	5 38 40.02	18 56 30.8	29.15
8	3 46 24.11	14 36 9.3	77.43	8	5 41 7.97	18 59 25.7	27.93
9	3 48 42.36	14 43 53.9	76.63	9	5 43 36.07	19 2 13.3	26.73
10	3 51 0.84	14 51 33.7	75.80	10	5 46 4.32	19 4 53.7	25.50
11	3 53 19.55	14 59 8.5	74.97	11	5 48 32.71	19 7 26.7	24.27
12	3 55 38.49	15 6 38.3	74.12	12	5 51 1.23	19 9 52.3	23.01
13	3 57 57.67	15 14 3.0	73.27	13	5 53 29.89	19 12 10.5	21.73
14	4 0 17.07	15 21 22.6	72.40	14	5 55 58.69	19 14 21.2	20.53
15	4 2 36.72	15 28 37.0	71.53	15	5 58 27.61	19 16 24.5	19.30
16	4 4 56.59	15 35 46.2	70.63	16	6 0 56.65	19 18 20.3	18.05
17	4 7 16.70	15 42 50.0	69.73	17	6 3 25.81	19 20 8.6	16.78
18	4 9 37.04	15 49 48.4	68.83	18	6 5 55.09	19 21 49.3	15.53
19	4 11 57.61	15 56 41.4	67.93	19	6 8 24.48	19 23 22.5	14.27
20	4 14 18.42	16 3 29.0	66.98	20	6 10 53.97	19 24 48.1	12.98
21	4 16 39.45	16 10 10.9	66.07	21	6 13 23.57	19 26 6.0	11.73
22	4 19 0.71	16 16 47.3	65.12	22	6 15 53.27	19 27 16.3	10.45
23	4 21 22.20	16 23 18.0	64.17	23	6 18 23.06	19 28 19.0	9.17
24	4 23 43.91	N. 16 29 43.0		24	6 20 52.94	N. 19 29 14.0	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 21.				SATURDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	6 20 52.94	N.19 29 14.0	7.88	0	8 21 6.37	N.17 41 50.3	53.03
1	6 23 22.91	19 30 1.3	6.62	1	8 23 35.27	17 36 32.1	54.22
2	6 25 52.96	19 30 41.0	5.30	2	8 26 4.04	17 31 6.8	55.37
3	6 28 23.09	19 31 12.8	4.03	3	8 28 32.68	17 25 34.6	56.52
4	6 30 53.29	19 31 37.0	2.73	4	8 31 1.20	17 19 55.5	57.68
5	6 33 23.56	19 31 53.4	1.45	5	8 33 29.59	17 14 9.4	58.82
6	6 35 53.90	19 32 2.1	0.15	6	8 35 57.84	17 8 16.5	59.95
7	6 38 24.30	19 32 3.0	1.15	7	8 38 25.95	17 2 16.8	61.08
8	6 40 54.75	19 31 56.1	2.43	8	8 40 53.92	16 56 10.3	62.20
9	6 43 25.25	19 31 41.5	3.75	9	8 43 21.75	16 49 57.1	63.30
10	6 45 55.80	19 31 19.0	5.05	10	8 45 49.42	16 43 37.3	64.40
11	6 48 26.39	19 30 48.8	6.35	11	8 48 16.95	16 37 10.9	65.50
12	6 50 57.01	19 30 10.7	7.65	12	8 50 44.33	16 30 37.9	66.58
13	6 53 27.67	19 29 24.8	8.95	13	8 53 11.55	16 23 58.4	67.65
14	6 55 58.36	19 28 31.1	10.27	14	8 55 38.61	16 17 12.5	68.72
15	6 58 29.07	19 27 29.5	11.55	15	8 58 5.51	16 10 20.2	69.77
16	7 0 59.80	19 26 20.2	12.87	16	9 0 32.25	16 3 21.6	70.82
17	7 3 30.55	19 25 3.0	14.15	17	9 2 58.83	15 56 16.7	71.85
18	7 6 1.30	19 23 38.1	15.47	18	9 5 25.23	15 49 5.6	72.87
19	7 8 32.06	19 22 5.3	16.75	19	9 7 51.47	15 41 48.4	73.90
20	7 11 2.82	19 20 24.8	18.07	20	9 10 17.53	15 34 25.0	74.90
21	7 13 33.58	19 18 36.4	19.35	21	9 12 43.43	15 26 55.6	75.88
22	7 16 4.33	19 16 40.3	20.65	22	9 15 9.14	15 19 20.3	76.88
23	7 18 35.06	N.19 14 36.4	21.93	23	9 17 34.68	N.15 11 39.0	77.85
FRIDAY 22.				SUNDAY 24.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	7 21 5.78	N.19 12 24.8	23.23	0	9 20 0.05	N.15 3 51.9	78.82
1	7 23 36.48	19 10 5.4	24.52	1	9 22 25.23	14 55 59.0	79.77
2	7 26 7.14	19 7 38.3	25.80	2	9 24 50.23	14 48 0.4	80.70
3	7 28 37.78	19 5 3.5	27.08	3	9 27 15.05	14 39 56.2	81.65
4	7 31 8.37	19 2 21.0	28.37	4	9 29 39.69	14 31 46.3	82.55
5	7 33 38.93	18 59 30.8	29.65	5	9 32 4.14	14 23 31.0	83.47
6	7 36 9.45	18 56 32.9	30.92	6	9 34 28.40	14 15 10.2	84.37
7	7 38 39.91	18 53 27.4	32.18	7	9 36 52.47	14 6 44.0	85.27
8	7 41 10.33	18 50 14.3	33.45	8	9 39 16.35	13 58 12.4	86.12
9	7 43 40.68	18 46 53.6	34.72	9	9 41 40.03	13 49 35.7	87.00
10	7 46 10.98	18 43 25.3	35.97	10	9 44 3.53	13 40 53.7	87.85
11	7 48 41.21	18 39 49.5	37.23	11	9 46 26.83	13 32 6.6	88.68
12	7 51 11.36	18 36 6.1	38.48	12	9 48 49.93	13 23 14.5	89.52
13	7 53 41.45	18 32 15.2	39.72	13	9 51 12.84	13 14 17.4	90.33
14	7 56 11.45	18 28 16.9	40.95	14	9 53 35.56	13 5 15.4	91.15
15	7 58 41.38	18 24 11.2	42.20	15	9 55 58.09	12 56 8.5	91.93
16	8 1 11.22	18 19 58.0	43.42	16	9 58 20.41	12 46 56.9	92.70
17	8 3 40.97	18 15 37.5	44.65	17	10 0 42.54	12 37 40.7	93.48
18	8 6 10.62	18 11 9.6	45.87	18	10 3 4.47	12 28 19.8	94.25
19	8 8 40.18	18 6 34.4	47.07	19	10 5 26.21	12 18 54.3	94.97
20	8 11 9.63	18 1 52.0	48.28	20	10 7 47.74	12 9 24.5	95.72
21	8 13 38.99	17 57 2.3	49.47	21	10 10 9.08	11 59 50.2	96.43
22	8 16 8.23	17 52 5.5	50.68	22	10 12 30.22	11 50 11.6	97.15
23	8 18 37.36	17 47 1.4	51.85	23	10 14 51.15	11 40 28.7	97.83
24	8 21 6.37	N.17 41 50.3		24	10 17 11.89	N.11 30 41.7	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec for 10 <sup>m</sup> .
MONDAY 25.				WEDNESDAY 27.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	10 17 11.89	N. 11 30 41.7	98.52	0	12 6 7.02	N. 2 44 37.9	116.12
1	10 19 32.43	11 20 50.6	99.18	1	12 8 19.08	2 33 1.2	116.17
2	10 21 52.77	11 10 55.5	99.83	2	12 10 31.01	2 21 24.2	116.22
3	10 24 12.91	11 0 56.5	100.48	3	12 12 42.79	2 9 46.9	116.25
4	10 26 32.86	10 50 53.6	101.12	4	12 14 54.44	1 58 9.4	116.27
5	10 28 52.60	10 40 46.9	101.73	5	12 17 5.96	1 46 31.8	116.27
6	10 31 12.15	10 30 36.5	102.33	6	12 19 17.34	1 34 54.2	116.28
7	10 33 31.50	10 20 22.5	102.93	7	12 21 28.60	1 23 16.5	116.25
8	10 35 50.66	10 10 4.9	103.50	8	12 23 39.71	1 11 39.0	116.23
9	10 38 9.62	9 59 43.9	104.08	9	12 25 50.70	1 0 1.6	116.20
10	10 40 28.38	9 49 19.4	104.63	10	12 28 1.58	0 48 24.4	116.13
11	10 42 46.95	9 38 51.6	105.17	11	12 30 12.33	0 36 47.6	116.08
12	10 45 5.33	9 28 20.6	105.70	12	12 32 22.97	0 25 11.1	116.02
13	10 47 23.51	9 17 46.4	106.22	13	12 34 33.48	0 13 35.0	115.92
14	10 49 41.50	9 7 9.1	106.72	14	12 36 43.87	N. 0 1 59.5	115.79
15	10 51 59.30	8 56 28.8	107.20	15	12 38 54.15	S. 0 9 35.5	115.72
16	10 54 16.91	8 45 45.6	107.68	16	12 41 4.31	0 21 9.8	115.60
17	10 56 34.33	8 34 59.5	108.15	17	12 43 14.37	0 32 43.4	115.47
18	10 58 51.56	8 24 10.6	108.60	18	12 45 24.31	0 44 16.2	115.32
19	11 1 8.60	8 13 19.0	109.03	19	12 47 34.15	0 55 48.2	115.18
20	11 3 25.45	8 2 24.8	109.45	20	12 49 43.89	1 7 19.3	115.02
21	11 5 42.12	7 51 28.1	109.87	21	12 51 53.52	1 18 49.4	114.85
22	11 7 58.61	7 40 28.9	110.27	22	12 54 3.05	1 30 18.5	114.67
23	11 10 14.91	N. 7 29 27.3	110.65	23	12 56 12.48	S. 1 41 46.5	114.47
TUESDAY 26.				THURSDAY 28.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	11 12 31.03	N. 7 18 23.4	111.02	0	12 58 21.82	S. 1 53 13.3	114.27
1	11 14 46.97	7 7 17.3	111.38	1	1 0 31.06	2 4 38.9	114.03
2	11 17 2.73	6 56 9.0	111.73	2	1 3 2.40.21	2 16 3.1	113.83
3	11 19 18.31	6 44 58.6	112.05	3	1 3 4.49.27	2 27 26.1	113.58
4	11 21 33.72	6 33 46.3	112.38	4	1 3 6.58.24	2 38 47.6	113.33
5	11 23 48.94	6 22 32.0	112.68	5	1 3 9.7.13	2 50 7.6	113.07
6	11 26 4.00	6 11 15.9	112.98	6	1 3 11.15.92	3 1 26.0	112.82
7	11 28 18.88	5 59 58.0	113.27	7	1 3 13.24.64	3 12 42.9	112.53
8	11 30 33.59	5 48 38.4	113.53	8	1 3 15.33.27	3 23 58.1	112.23
9	11 32 48.13	5 37 17.2	113.78	9	1 3 17.41.83	3 35 11.6	111.93
10	11 35 2.51	5 25 54.5	114.03	10	1 3 19.50.31	3 46 23.2	111.65
11	11 37 16.71	5 14 30.3	114.25	11	1 3 21.58.72	3 57 33.1	111.32
12	11 39 30.75	5 3 4.8	114.48	12	1 3 24.7.05	4 8 41.0	111.00
13	11 41 44.63	4 51 37.9	114.67	13	1 3 26.15.31	4 19 47.0	110.65
14	11 43 58.35	4 40 9.9	114.88	14	1 3 28.23.50	4 30 50.9	110.32
15	11 46 11.91	4 28 40.6	115.05	15	1 3 30.31.62	4 41 52.8	109.95
16	11 48 25.31	4 17 10.3	115.22	16	1 3 32.39.67	4 52 52.5	109.60
17	11 50 38.55	4 5 39.0	115.38	17	1 3 34.47.66	5 3 50.1	109.22
18	11 52 51.64	3 54 6.7	115.52	18	1 3 36.55.59	5 14 45.4	108.83
19	11 55 4.57	3 42 33.6	115.63	19	1 3 39.3.46	5 25 38.4	108.45
20	11 57 17.36	3 30 59.8	115.77	20	1 3 41.11.27	5 36 29.1	108.03
21	11 59 29.99	3 19 25.2	115.88	21	1 3 43.19.02	5 47 17.3	107.63
22	12 1 42.48	3 7 49.9	115.95	22	1 3 45.26.71	5 58 3.1	107.22
23	12 3 54.83	2 56 14.2	116.05	23	1 3 47.34.35	6 8 46.4	106.80
24	12 6 7.02	N. 2 44 37.9		24	1 3 49.41.94	S. 6 19 27.2	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 29.				SUNDAY 31.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	13 49 41.94	S. 6 19 27.2	106.35	0	15 31 12.18	S. 13 46 42.0	76.85
1	13 51 49.47	6 30 5.3	105.92	1	15 33 18.81	13 54 23.1	76.08
2	13 53 56.96	6 40 40.8	105.47	2	15 35 25.44	14 1 59.6	75.33
3	13 56 4.40	6 51 13.6	105.00	3	15 37 32.08	14 9 31.6	74.55
4	13 58 11.79	7 1 43.6	104.52	4	15 39 38.72	14 16 58.9	73.78
5	14 0 19.14	7 12 10.7	104.07	5	15 41 45.36	14 24 21.6	73.00
6	14 2 26.45	7 22 35.1	103.55	6	15 43 52.01	14 31 39.6	72.22
7	14 4 33.71	7 32 56.4	103.08	7	15 45 58.66	14 38 52.9	71.43
8	14 6 40.94	7 43 14.9	102.57	8	15 48 5.32	14 46 1.5	70.63
9	14 8 48.13	7 53 30.3	102.05	9	15 50 11.98	14 53 5.3	69.85
10	14 10 55.28	8 3 42.6	101.53	10	15 52 18.65	15 0 4.4	69.03
11	14 13 2.39	8 13 51.8	101.02	11	15 54 25.32	15 6 58.6	68.25
12	14 15 9.47	8 23 57.9	100.47	12	15 56 32.00	15 13 48.1	67.43
13	14 17 16.52	8 34 0.7	99.93	13	15 58 38.69	15 20 32.7	66.62
14	14 19 23.54	8 44 0.3	99.38	14	16 0 45.38	15 27 12.4	65.82
15	14 21 30.53	8 53 56.6	98.83	15	16 2 52.08	15 33 47.3	64.98
16	14 23 37.49	9 3 49.6	98.27	16	16 4 58.79	15 40 17.2	64.17
17	14 25 44.43	9 13 39.2	97.68	17	16 7 5.50	15 46 42.2	63.33
18	14 27 51.34	9 23 25.3	97.12	18	16 9 12.21	15 53 2.2	62.52
19	14 29 58.22	9 33 8.0	96.53	19	16 11 18.94	15 59 17.3	61.68
20	14 32 5.09	9 42 47.2	95.93	20	16 13 25.67	16 5 27.4	60.85
21	14 34 11.93	9 52 22.8	95.33	21	16 15 32.41	16 11 32.5	60.00
22	14 36 18.75	10 1 54.8	94.73	22	16 17 39.15	16 17 32.5	59.18
23	14 38 25.55	S. 10 11 23.2	94.12	23	16 19 45.90	S. 16 23 27.6	58.32
SATURDAY 30.				MONDAY, APRIL 1.			
0	14 40 32.33	S. 10 20 47.9	93.50	0	16 21 52.65	S. 16 29 17.5	
1	14 42 39.10	10 30 8.9	92.87				
2	14 44 45.85	10 39 26.1	92.25				
3	14 46 52.58	10 48 39.6	91.60				
4	14 48 59.30	10 57 49.2	90.97				
5	14 51 6.01	11 6 55.0	90.30				
6	14 53 12.70	11 15 56.8	89.65				
7	14 55 19.38	11 24 54.7	88.98				
8	14 57 26.06	11 33 48.6	88.32				
9	14 59 32.73	11 42 38.5	87.65				
10	15 1 39.38	11 51 24.4	86.95				
11	15 3 46.04	12 0 6.1	86.28				
12	15 5 52.68	12 8 43.8	85.58				
13	15 7 59.32	12 17 17.3	84.88				
14	15 10 5.95	12 25 46.6	84.18				
15	15 12 12.58	12 34 11.7	83.47				
16	15 14 19.20	12 42 32.5	82.75				
17	15 16 25.83	12 50 49.0	82.03				
18	15 18 32.45	12 59 1.2	81.32				
19	15 20 39.07	13 7 9.1	80.58				
20	15 22 45.69	13 15 12.6	79.83				
21	15 24 52.31	13 23 11.6	79.10				
22	15 26 58.93	13 31 6.2	78.37				
23	15 29 5.55	13 38 56.4	77.60				
24	15 31 12.18	S. 13 46 42.0					

## PHASES OF THE MOON.

☾ Last Quarter - - <sup>d</sup> 5 <sup>h</sup> 8 <sup>m</sup> 5.2  
 ● New Moon - - 13 11 17.2  
 ☽ First Quarter - - 20 15 58.0  
 ○ Full Moon - - 27 11 26.3

☾ Apogee - - - - - <sup>d</sup> 7 <sup>h</sup> 20  
 ☾ Perigee - - - - - 23 15



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
		° ' "		° ' "		° ' "		° ' "
1	Pollux W.	88 10 49	2569	89 50 27	2585	91 29 42	2604	93 8 32
	Regulus W.	52 9 46	2509	53 50 47	2526	55 31 24	2543	57 11 37
	Jupiter W.	30 47 22	2470	32 29 18	2487	34 10 50	2504	35 51 58
	Antares E.	48 37 16	2623	46 58 52	2647	45 21 1	2672	43 43 43
	α Aquilæ E.	96 22 31	3018	94 52 40	3033	93 23 8	3048	91 53 55
	SUN E.	140 33 36	2845	139 0 7	2865	137 27 3	2884	135 54 24
2	Regulus W.	65 26 37	2649	67 4 26	2666	68 41 51	2683	70 18 54
	Jupiter W.	44 11 38	2607	45 50 23	2624	47 28 45	2641	49 6 45
	Spica ♀ W.	13 20 42	3183	14 47 11	3097	16 15 24	3038	17 44 50
	Antares E.	35 46 13	2843	34 12 41	2877	32 39 53	2913	31 7 51
	α Aquilæ E.	84 33 14	3159	83 6 16	3180	81 39 43	3201	80 13 35
	SUN E.	128 17 4	2997	126 46 47	3015	125 16 53	3034	123 47 22
3	Regulus W.	78 18 36	2781	79 53 29	2796	81 28 2	2811	83 2 13
	Jupiter W.	57 11 11	2738	58 47 0	2753	60 22 30	2768	61 57 40
	Spica ♀ W.	25 20 15	2931	26 51 55	2930	28 23 36	2933	29 55 13
	Antares E.	23 41 47	3225	22 16 7	3304	20 52 0	3398	19 29 41
	α Aquilæ E.	73 9 38	3342	71 46 15	3368	70 23 22	3394	69 0 58
	SUN E.	116 25 17	3140	114 57 56	3157	113 30 55	3173	112 4 13
4	Regulus W.	90 48 40	2896	92 21 4	2908	93 53 13	2920	95 25 6
	Jupiter W.	69 48 51	2851	71 22 13	2863	72 55 19	2875	74 28 10
	Spica ♀ W.	37 31 40	2970	39 2 31	2978	40 33 12	2985	42 3 43
	α Aquilæ E.	62 17 2	3572	60 57 57	3604	59 39 27	3639	58 21 35
	SUN E.	104 55 25	3264	103 30 31	3278	102 5 54	3291	100 41 32
5	Jupiter W.	82 8 49	2939	83 40 18	2948	85 11 36	2957	86 42 43
	Spica ♀ W.	49 33 48	3033	51 3 20	3039	52 32 44	3047	54 1 58
	α Aquilæ E.	52 2 24	3883	50 48 47	3932	49 36 0	3983	48 24 4
	SUN E.	93 43 18	3361	92 20 17	3372	90 57 29	3381	89 34 51
6	Jupiter W.	94 15 56	2998	95 46 11	3005	97 16 18	3009	98 46 20
	Spica ♀ W.	61 26 18	3081	62 54 51	3086	64 23 18	3090	65 51 40
	Antares W.	17 44 9	3769	18 59 43	3674	20 16 58	3596	21 35 37
	SUN E.	82 44 5	3428	81 22 20	3433	80 0 41	3439	78 39 9
7	Jupiter W.	106 15 20	3028	107 44 58	3030	109 14 34	3031	110 44 9
	Spica ♀ W.	73 12 33	3105	74 40 36	3107	76 8 37	3107	77 36 38
	Antares W.	28 22 28	3350	29 45 42	3329	31 9 20	3308	32 33 22
	SUN E.	71 52 40	3461	70 31 32	3463	69 10 27	3463	67 49 22
8	Spica ♀ W.	84 56 45	3103	86 24 51	3101	87 52 59	3099	89 21 10
	Antares W.	39 37 55	3226	41 3 33	3215	42 29 24	3204	43 55 28
	SUN E.	61 4 5	3462	59 42 58	3461	58 21 50	3457	57 0 38
9	Spica ♀ W.	96 43 4	3077	98 11 42	3072	99 40 26	3067	101 9 16
	Antares W.	51 8 34	3149	52 35 44	3141	54 3 4	3131	55 30 36
	SUN E.	50 13 45	3435	48 52 8	3430	47 30 25	3424	46 8 36
10	Antares W.	62 50 56	3077	64 19 34	3068	65 48 23	3058	67 17 24
	SUN E.	39 17 46	3386	37 55 13	3380	36 32 32	3371	35 9 42
11	Antares W.	74 45 23	3001	76 15 35	2991	77 45 59	2981	79 16 36
	SUN E.	28 13 19	3324	26 49 35	3317	25 25 43	3309	24 1 42



MEAN TIME.  
LUNAR DISTANCES.

Day of the Month	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
1	Pollux W.	94 46 58	2639	96 25 0	2658	98 2 37	2675	99 39 51	2693
	Regulus W.	58 51 25	2579	60 30 49	2596	62 9 49	2614	63 48 25	2632
	Jupiter W.	37 32 42	2538	39 13 2	2556	40 52 58	2573	42 32 30	2590
	Antares E.	42 6 59	2724	40 30 51	2752	38 55 20	2780	37 20 26	2811
	α Aquilæ E.	90 25 3	3083	88 56 32	3101	87 28 23	3119	86 0 37	3138
	SUN E.	134 22 8	2921	132 50 16	2940	131 18 48	2959	129 47 44	2978
2	Regulus W.	71 55 34	2717	73 31 52	2733	75 7 48	2749	76 43 23	2766
	Jupiter W.	50 44 21	2674	52 21 36	2690	53 58 29	2707	55 35 0	2722
	Spica η W.	19 15 6	2970	20 45 57	2982	22 17 10	2994	23 48 38	2993
	Antares E.	29 36 39	2997	28 6 22	3043	26 37 3	3096	25 8 49	3156
	α Aquilæ E.	78 47 53	3246	77 22 38	3269	75 57 50	3292	74 33 29	3318
	SUN E.	122 18 13	3070	120 49 27	3088	119 21 3	3105	117 53 0	3122
3	Regulus W.	84 36 8	2841	86 9 43	2856	87 42 59	2869	89 15 58	2882
	Jupiter W.	63 32 31	2797	65 7 3	2811	66 41 16	2825	68 15 12	2838
	Spica η W.	31 26 46	2942	32 58 12	2948	34 29 30	2954	36 0 40	2962
	Antares E.	18 9 29	3650	16 51 49	3825	15 37 13	4048	14 26 21	4343
	α Aquilæ E.	67 39 6	3450	66 17 46	3479	64 56 58	3508	63 36 43	3539
	SUN E.	110 37 51	3204	109 11 47	3220	107 46 2	3236	106 20 35	3250
4	Regulus W.	96 56 44	2944	98 28 7	2954	99 59 17	2966	101 30 13	2975
	Jupiter W.	76 0 45	2898	77 33 6	2909	79 5 13	2920	80 37 7	2929
	Spica η W.	43 34 4	3001	45 4 15	3010	46 34 15	3018	48 4 6	3025
	α Aquilæ E.	57 4 22	3712	55 47 48	3752	54 31 56	3793	53 16 47	3838
	SUN E.	99 17 26	3317	97 53 34	3328	96 29 55	3340	95 6 30	3352
5	Jupiter W.	88 13 40	2973	89 44 27	2980	91 15 5	2987	92 45 34	2993
	Spica η W.	55 31 5	3060	57 0 4	3066	58 28 55	3071	59 57 40	3077
	α Aquilæ E.	47 13 4	4099	46 3 1	4162	44 53 59	4232	43 46 3	4305
	SUN E.	88 12 24	3399	86 50 6	3407	85 27 57	3415	84 5 57	3422
6	Jupiter W.	100 16 17	3018	101 46 8	3020	103 15 56	3024	104 45 39	3026
	Spica η W.	67 19 57	3096	68 48 11	3100	70 16 21	3102	71 44 28	3104
	Antares W.	22 55 23	3483	24 16 6	3442	25 37 35	3406	26 59 45	3377
	SUN E.	77 17 43	3448	75 56 21	3453	74 35 4	3455	73 13 50	3459
7	Jupiter W.	112 13 43	3032	113 43 16	3031	115 12 50	3031	116 42 25	3030
	Spica η W.	79 4 38	3107	80 32 39	3108	82 0 39	3106	83 28 41	3105
	Antares W.	33 57 43	3277	35 22 22	3262	36 47 18	3248	38 12 30	3237
	SUN E.	66 28 19	3465	65 7 16	3465	63 46 13	3465	62 25 10	3463
8	Spica η W.	90 49 24	3092	92 17 43	3090	93 46 5	3086	95 14 32	3082
	Antares W.	45 21 43	3186	46 48 9	3177	48 14 46	3167	49 41 35	3158
	SUN E.	55 39 24	3452	54 18 6	3447	52 56 43	3445	51 35 17	3439
9	Spica η W.	102 38 12	3056	104 7 15	3050	105 36 26	3044	107 5 44	3038
	Antares W.	56 58 18	3114	58 26 11	3105	59 54 15	3096	61 22 30	3087
	SUN E.	44 46 40	3413	43 24 38	3406	42 2 28	3400	40 40 11	3393
10	Antares W.	68 46 36	3039	70 16 0	3030	71 45 36	3021	73 15 23	3010
	SUN E.	33 46 43	3356	32 23 36	3347	31 0 19	3339	29 36 53	3332
11	Antares W.	80 47 25	2961	82 18 26	2951	83 49 40	2942	85 21 6	2931
	SUN E.	22 37 32	3295	21 13 15	3289	19 48 51	3284	18 24 21	3281



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	P. L. of diff.
15	SUN W.	18 38 1	3012	20 7 59	2996	21 38 17	2983	23 8 51	2971
	Aldebaran E.	54 42 40	2629	53 4 24	2620	51 25 56	2612	49 47 17	2604
	Mars E.	77 25 36	2797	75 51 4	2788	74 16 20	2780	72 41 26	2772
	Pollux E.	98 44 13	2690	97 7 19	2680	95 30 12	2671	93 52 53	2663
16	SUN W.	30 45 31	2914	32 17 32	2904	33 49 46	2894	35 22 12	2886
	Aldebaran E.	41 31 4	2561	39 51 15	2552	38 11 15	2546	36 31 5	2538
	Mars E.	64 44 12	2732	63 8 15	2725	61 32 8	2719	59 55 53	2711
	Pollux E.	85 43 21	2620	84 4 53	2613	82 26 15	2605	80 47 27	2597
17	SUN W.	43 7 21	2840	44 40 57	2832	46 14 43	2824	47 48 40	2816
	Mars E.	51 52 22	2681	50 15 16	2676	48 38 4	2670	47 0 44	2662
	Pollux E.	72 31 1	2564	70 51 17	2559	69 11 25	2552	67 31 24	2544
	Regulus E.	108 16 13	2499	106 34 58	2492	104 53 33	2484	103 11 57	2476
18	SUN W.	55 41 3	2776	57 16 3	2769	58 51 12	2761	60 26 31	2753
	α Arietis W.	23 7 0	3579	24 25 57	3431	25 47 38	3307	27 11 41	3201
	Mars E.	38 52 44	2650	37 14 57	2649	35 37 8	2649	33 59 19	2641
	Pollux E.	59 9 34	2524	57 28 54	2520	55 48 9	2516	54 7 18	2511
	Regulus E.	94 41 29	2441	92 58 53	2436	91 16 9	2428	89 33 14	2421
	Jupiter E.	113 53 9	2402	112 9 37	2396	110 25 57	2389	108 42 6	2381
19	SUN W.	68 25 29	2719	70 1 44	2711	71 38 9	2705	73 14 43	2697
	α Arietis W.	34 37 45	2866	36 10 47	2822	37 44 46	2783	39 19 36	2744
	Mars E.	25 51 9	2680	24 14 2	2695	22 37 15	2716	21 0 56	2741
	Pollux E.	45 42 25	2509	44 1 25	2510	42 20 26	2512	40 39 30	2511
	Regulus E.	80 56 21	2389	79 12 31	2382	77 28 31	2377	75 44 23	2371
	Jupiter E.	100 0 33	2351	98 15 47	2344	96 30 51	2338	94 45 47	2331
20	SUN W.	81 19 47	2665	82 57 14	2658	84 34 50	2653	86 12 33	2645
	α Arietis W.	47 24 6	2615	49 2 40	2595	50 41 42	2577	52 21 9	2560
	Aldebaran W.	13 7 55	2342	14 52 53	2336	16 38 0	2330	18 23 16	2322
	Pollux E.	32 16 59	2564	30 37 15	2583	28 57 56	2607	27 19 10	2601
	Regulus E.	67 1 27	2340	65 16 25	2334	63 31 15	2328	61 45 57	2321
	Jupiter E.	85 58 13	2302	84 12 16	2296	82 26 11	2291	80 39 58	2284
21	SUN W.	94 23 13	2618	96 1 44	2613	97 40 22	2607	99 19 7	2600
	α Arietis W.	60 43 48	2490	62 25 15	2479	64 6 58	2468	65 48 56	2459
	Aldebaran W.	27 11 42	2296	28 57 47	2291	30 44 0	2286	32 30 20	2281
	Regulus E.	52 57 25	2296	51 11 19	2291	49 25 6	2285	47 38 45	2280
	Jupiter E.	71 46 50	2258	69 59 49	2253	68 12 41	2249	66 25 26	2244
	Spica ♀ E.	106 37 36	2326	104 52 14	2320	103 6 44	2315	101 21 6	2310
22	SUN W.	107 34 34	2580	109 13 57	2575	110 53 26	2572	112 33 0	2566
	α Arietis W.	74 21 56	2418	76 5 5	2412	77 48 22	2406	79 31 48	2400
	Aldebaran W.	41 23 43	2259	43 10 43	2266	44 57 48	2252	46 44 59	2244
	Mars W.	16 59 40	2701	18 36 19	2647	20 14 10	2604	21 53 0	2577
	Regulus E.	38 45 19	2259	36 58 19	2255	35 11 13	2251	33 24 2	2244
	Jupiter E.	57 27 27	2222	55 39 32	2219	53 51 33	2215	52 3 27	2211
	Spica ♀ E.	92 31 8	2287	90 44 49	2283	88 58 24	2279	87 11 54	2274
23	SUN W.	120 51 53	2555	122 31 50	2553	124 11 49	2552	125 51 50	2551
	α Arietis W.	88 10 34	2382	89 54 34	2381	91 38 36	2379	93 22 41	2377
	Aldebaran W.	55 42 4	2235	57 29 40	2232	59 17 20	2231	61 5 2	2229



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>	
15	SUN W.	24 39 42	2958	26 10 48	2946	27 42 8	2935	29 13 43	2924
	Aldebaran E.	48 8 26	2593	46 29 22	2585	44 50 7	2577	43 10 41	2569
	Mars E.	71 6 20	2763	69 31 4	2755	67 55 37	2747	66 19 59	2740
	Pollux E.	92 15 22	2652	90 37 38	2645	88 59 44	2636	87 21 38	2628
16	SUN W.	36 54 50	2875	38 27 41	2866	40 0 43	2858	41 33 56	2849
	Aldebaran E.	34 50 43	2530	33 10 11	2522	31 29 28	2514	29 48 34	2507
	Mars E.	58 19 28	2704	56 42 54	2698	55 6 11	2692	53 29 21	2686
	Pollux E.	79 8 29	2591	77 29 21	2583	75 50 3	2577	74 10 36	2571
17	SUN W.	49 22 48	2808	50 57 6	2799	52 31 35	2791	54 6 14	2784
	Mars E.	45 23 18	2662	43 45 47	2658	42 8 10	2654	40 30 29	2652
	Pollux E.	65 51 16	2541	64 11 0	2537	62 30 38	2532	60 50 9	2528
	Regulus E.	101 30 12	2470	99 48 16	2463	98 6 10	2455	96 23 54	2449
18	SUN W.	62 1 59	2747	63 37 37	2739	65 13 25	2732	66 49 22	2725
	α Arietis W.	28 37 46	3115	30 5 37	3039	31 35 1	2974	33 5 47	2916
	Mars E.	32 21 30	2652	30 43 45	2655	29 6 4	2661	27 28 31	2669
	Pollux E.	52 26 25	2512	50 45 28	2510	49 4 28	2509	47 23 27	2508
	Regulus E.	87 50 11	2415	86 6 57	2409	84 23 35	2401	82 40 2	2396
	Jupiter E.	106 58 6	2376	105 13 57	2369	103 29 38	2363	101 45 10	2357
19	SUN W.	74 51 26	2691	76 28 18	2684	78 5 19	2677	79 42 29	2672
	α Arietis W.	40 55 13	2716	42 31 32	2687	44 8 29	2661	45 46 2	2638
	Mars E.	19 25 12	2780	17 50 18	2830	16 16 29	2899	14 44 9	2998
	Pollux E.	38 58 40	2522	37 17 57	2529	35 37 24	2538	33 57 3	2550
	Regulus E.	74 0 5	2364	72 15 39	2357	70 31 3	2352	68 46 19	2346
	Jupiter E.	93 0 34	2326	91 15 12	2320	89 29 41	2313	87 44 1	2307
20	SUN W.	87 50 25	2641	89 28 25	2635	91 6 33	2629	92 44 49	2623
	α Arietis W.	54 0 59	2543	55 41 12	2529	57 21 45	2515	59 2 37	2502
	Aldebaran W.	20 8 41	2318	21 54 14	2312	23 39 56	2307	25 25 45	2302
	Pollux E.	25 41 3	2673	24 3 47	2720	22 27 33	2781	20 52 40	2859
	Regulus E.	60 0 31	2317	58 14 56	2312	56 29 14	2306	54 43 23	2301
	Jupiter E.	78 53 36	2280	77 7 7	2274	75 20 29	2268	73 33 43	2264
21	SUN W.	100 57 59	2596	102 36 59	2593	104 16 4	2588	105 55 16	2583
	α Arietis W.	67 31 7	2449	69 13 32	2441	70 56 9	2433	72 38 57	2425
	Aldebaran W.	34 16 47	2277	36 3 21	2272	37 50 2	2267	39 36 50	2264
	Regulus E.	45 52 17	2277	44 5 43	2271	42 19 1	2267	40 32 13	2263
	Jupiter E.	64 38 3	2239	62 50 34	2235	61 2 58	2230	59 15 15	2226
	Spica ♀ E.	99 35 20	2304	97 49 27	2300	96 3 27	2296	94 17 21	2291
22	SUN W.	114 12 39	2565	115 52 22	2562	117 32 9	2560	119 11 59	2557
	α Arietis W.	81 15 21	2396	82 59 1	2392	84 42 47	2388	86 26 39	2386
	Aldebaran W.	48 32 15	2245	50 19 36	2242	52 7 1	2239	53 54 31	2237
	Mars W.	23 32 36	2542	25 12 51	2520	26 53 37	2501	28 34 49	2485
	Regulus E.	31 36 46	2245	29 49 25	2241	28 1 59	2239	26 14 29	2236
	Jupiter E.	50 15 17	2208	48 27 2	2206	46 38 43	2202	44 50 19	2200
	Spica ♀ E.	85 25 19	2272	83 38 39	2270	81 51 55	2268	80 5 8	2265
23	SUN W.	127 31 52	2551	129 11 55	2551	130 51 58	2551	132 32 1	2551
	α Arietis W.	95 6 46	2378	96 50 52	2378	98 34 58	2380	100 19 2	2381
	Aldebaran W.	62 52 46	2228	64 40 32	2227	66 28 19	2226	68 16 7	2227



MEAN TIME.											
LUNAR DISTANCES.											
Day of the Month.	Star's Name and Position.		Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	P.L. of diff.	
			° ' "		° ' "		° ' "		° ' "		
23	Mars	W.	30 16 24	2471	31 58 18	2460	33 40 28	2450	35 22 52	2442	
	Jupiter	E.	43 1 52	2198	41 13 22	2196	39 24 48	2195	37 36 13	2193	
	Spica $\eta$	E.	78 18 17	2264	76 31 24	2262	74 44 28	2260	72 57 30	2260	
24	Aldebaran	W.	70 3 55	2227	71 51 43	2227	73 39 30	2229	75 27 15	2229	
	Mars	W.	43 57 13	2416	45 40 27	2413	47 23 43	2412	49 7 0	2410	
	Pollux	W.	27 27 30	2501	29 8 42	2473	30 50 33	2449	32 32 58	2439	
	Jupiter	E.	28 32 55	2191	26 44 14	2192	24 55 35	2193	23 6 57	2193	
	Spica $\eta$	E.	64 2 33	2261	62 15 38	2264	60 28 45	2265	58 41 54	2268	
	Antares	E.	109 51 10	2294	108 5 2	2294	106 18 54	2293	104 32 45	2293	
25	Aldebaran	W.	84 25 24	2242	86 12 49	2245	88 0 9	2249	89 47 24	2254	
	Mars	W.	57 43 35	2415	59 26 49	2417	61 9 59	2420	62 53 5	2424	
	Pollux	W.	41 10 32	2374	42 54 44	2370	44 39 2	2366	46 23 26	2364	
	Spica $\eta$	E.	49 48 58	2291	48 2 45	2297	46 16 41	2304	44 30 47	2312	
	Antares	E.	95 42 20	2302	93 56 24	2306	92 10 34	2310	90 24 49	2314	
26	Mars	W.	71 27 3	2449	73 9 28	2457	74 51 42	2463	76 33 47	2471	
	Pollux	W.	55 5 44	2368	56 50 5	2371	58 34 21	2375	60 18 31	2380	
	Regulus	W.	18 32 50	2281	20 19 17	2289	22 5 33	2296	23 51 38	2304	
	Spica $\eta$	E.	35 44 41	2368	34 0 20	2382	32 16 20	2399	30 32 44	2415	
	Antares	E.	81 37 55	2344	79 52 59	2352	78 8 15	2360	76 23 43	2368	
27	Mars	W.	85 1 16	2517	86 42 6	2526	88 22 43	2538	90 3 4	2543	
	Pollux	W.	68 57 14	2415	70 40 27	2423	72 23 29	2433	74 6 17	2443	
	Regulus	W.	32 39 2	2348	34 23 51	2359	36 8 25	2369	37 52 45	2380	
	Jupiter	W.	14 32 58	2315	16 18 35	2325	18 3 58	2335	19 49 6	2346	
	Antares	E.	67 44 24	2421	66 1 19	2432	64 18 30	2444	62 35 58	2458	
28	Mars	W.	98 20 48	2610	99 59 29	2624	101 37 52	2637	103 15 57	2651	
	Pollux	W.	82 36 38	2497	84 17 55	2510	85 58 54	2522	87 39 36	2535	
	Regulus	W.	46 30 19	2439	48 12 58	2451	49 55 20	2464	51 37 24	2477	
	Jupiter	W.	28 30 48	2403	30 14 18	2417	31 57 29	2429	33 40 23	2442	
	Antares	E.	54 8 20	2533	52 27 53	2550	50 47 49	2568	49 8 10	2587	
	$\alpha$ Aquilæ	E.	101 25 35	2966	99 54 40	2974	98 23 55	2982	96 53 20	2992	
29	Pollux	W.	95 58 28	2604	97 37 17	2620	99 15 45	2635	100 53 53	2649	
	Regulus	W.	60 3 1	2546	61 43 10	2560	63 23 0	2575	65 2 30	2589	
	Jupiter	W.	42 10 8	2510	43 51 7	2525	45 31 46	2539	47 12 5	2553	
	Antares	E.	40 56 40	2694	39 19 52	2719	37 43 37	2745	36 7 57	2775	
	$\alpha$ Aquilæ	E.	89 23 48	3054	87 54 42	3070	86 25 56	3086	84 57 29	3104	
30	Regulus	W.	73 15 2	2663	74 52 32	2677	76 29 43	2692	78 6 34	2706	
	Jupiter	W.	55 28 43	2626	57 7 2	2641	58 45 2	2655	60 22 42	2670	
	Spica $\eta$	W.	20 27 43	2881	22 0 26	2868	23 33 26	2859	25 6 37	2853	
	Antares	E.	28 20 2	2958	26 48 57	3008	25 18 54	3065	23 50 1	3130	
	$\alpha$ Aquilæ	E.	77 40 49	3202	76 14 42	3224	74 49 1	3247	73 23 48	3271	
31	Regulus	W.	86 6 1	2778	87 40 58	2792	89 15 37	2805	90 49 58	2819	
	Jupiter	W.	68 26 11	2741	70 1 56	2755	71 37 23	2769	73 12 32	2782	
	Spica $\eta$	W.	32 52 47	2869	34 25 46	2876	35 58 36	2884	37 31 16	2891	
	$\alpha$ Aquilæ	E.	66 25 6	3407	65 2 57	3438	63 41 23	3469	62 20 24	3502	
	Fomalhaut	E.	99 10 26	3060	97 41 27	3073	96 12 44	3084	94 44 15	3096	
	Sun	E.	136 18 14	3148	134 51 2	3163	133 24 8	3177	131 57 31	3191	



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>''</sup>		<sup>o</sup> <sup>i</sup> <sup>''</sup>		<sup>o</sup> <sup>i</sup> <sup>''</sup>		<sup>o</sup> <sup>i</sup> <sup>''</sup>	
23	Mars W.	37 5 27	2434	38 48 13	2429	40 31 7	2424	42 14 8	2419
	Jupiter E.	35 47 35	2192	33 58 56	2192	32 10 16	2191	30 21 35	2192
	Spica $\eta$ E.	71 10 31	2260	69 23 32	2259	67 36 32	2260	65 49 33	2260
24	Aldebaran W.	77 14 59	2231	79 2 40	2233	80 50 19	2236	82 37 53	2238
	Mars W.	50 50 20	2410	52 33 40	2410	54 17 0	2411	56 0 19	2413
	Pollux W.	34 15 51	2413	35 59 7	2401	37 42 41	2390	39 26 30	2381
	Jupiter E.	21 18 22	2196	19 29 49	2199	17 41 20	2202	15 52 55	2205
	Spica $\eta$ E.	56 55 8	2271	55 8 26	2275	53 21 50	2280	51 35 21	2284
	Antares E.	102 46 36	2295	101 0 29	2296	99 14 23	2298	97 28 20	2300
25	Aldebaran W.	91 34 32	2259	93 21 32	2264	95 8 25	2270	96 55 9	2275
	Mars W.	64 36 6	2428	66 19 1	2435	68 1 49	2438	69 44 30	2443
	Pollux W.	48 7 53	2362	49 52 22	2362	51 36 51	2363	53 21 19	2365
	Spica $\eta$ E.	42 45 5	2321	40 59 36	2331	39 14 21	2342	37 29 22	2354
	Antares E.	88 39 10	2319	86 53 38	2325	85 8 15	2331	83 23 0	2337
26	Mars W.	78 15 41	2479	79 57 23	2487	81 38 54	2497	83 20 11	2506
	Pollux W.	62 2 34	2387	63 46 28	2392	65 30 14	2400	67 13 49	2407
	Regulus W.	25 37 32	2312	27 23 14	2321	29 8 43	2330	30 53 59	2339
	Spica $\eta$ E.	28 49 36	2441	27 6 59	2465	25 24 57	2494	23 43 36	2528
	Antares E.	74 39 23	2377	72 55 16	2388	71 11 24	2398	69 27 47	2408
27	Mars W.	91 43 10	2561	93 22 59	2572	95 2 33	2585	96 41 49	2597
	Pollux W.	75 48 51	2453	77 31 11	2463	79 13 16	2474	80 55 5	2486
	Regulus W.	39 36 48	2391	41 20 36	2403	43 4 7	2414	44 47 22	2426
	Jupiter W.	21 33 59	2357	23 18 36	2368	25 2 57	2380	26 47 1	2391
	Antares E.	60 53 46	2472	59 11 53	2487	57 30 21	2502	55 49 10	2517
28	Mars W.	104 53 43	2666	106 31 9	2680	108 8 16	2694	109 45 4	2710
	Pollux W.	89 20 0	2548	91 0 6	2563	92 39 52	2576	94 19 20	2591
	Regulus W.	53 19 9	2490	55 0 36	2505	56 41 43	2517	58 22 32	2532
	Jupiter W.	35 22 58	2455	37 5 14	2469	38 47 11	2482	40 28 49	2496
	Antares E.	47 28 57	2606	45 50 10	2626	44 11 51	2647	42 34 0	2670
	$\alpha$ Aquilæ E.	95 22 57	3002	93 52 47	3013	92 22 51	3026	90 53 11	3040
29	Pollux W.	102 31 41	2665	104 9 8	2680	105 46 15	2696	107 23 0	2712
	Regulus W.	66 41 40	2604	68 20 30	2618	69 59 1	2633	71 37 11	2647
	Jupiter W.	48 52 5	2568	50 31 44	2582	52 11 4	2597	53 50 3	2611
	Antares E.	34 32 56	2805	32 58 34	2838	31 24 53	2874	29 52 3	2914
	$\alpha$ Aquilæ E.	83 29 24	3121	82 1 40	3140	80 34 19	3160	79 7 22	3180
30	Regulus W.	79 43 6	2720	81 19 19	2735	82 55 12	2750	84 30 46	2764
	Jupiter W.	62 0 2	2684	63 37 3	2698	65 13 45	2714	66 50 7	2727
	Spica $\eta$ W.	26 39 54	2854	28 13 12	2855	29 46 29	2859	31 19 41	2863
	Antares E.	22 22 28	3207	20 56 27	3298	19 32 13	3408	18 10 6	3545
	$\alpha$ Aquilæ E.	71 59 3	3297	70 34 48	3322	69 11 2	3350	67 47 48	3378
31	Regulus W.	92 24 1	2832	93 57 47	2845	95 31 16	2859	97 4 28	2871
	Jupiter W.	74 47 23	2796	76 21 56	2808	77 56 13	2822	79 30 12	2834
	Spica $\eta$ W.	39 3 46	2901	40 36 4	2909	42 8 11	2918	43 40 7	2928
	$\alpha$ Aquilæ E.	61 0 2	3536	59 40 18	3572	58 21 13	3610	57 2 50	3649
	Fomalhaut E.	93 16 1	3109	91 48 2	3122	90 20 19	3134	88 52 51	3147
	SUN E.	130 31 11	3204	129 5 7	3218	127 39 19	3231	126 13 47	3245



## CONFIGURATIONS OF THE SATELLITES OF JUPITER,

At 12<sup>h</sup>, MEAN TIME.

Day of the Month,	West.	East.
1	4 <sup>•</sup> -3 1 <sup>•</sup> ○	2 <sup>•</sup>
2	4 <sup>•</sup> 2 <sup>•</sup> ○	+1 -3
3	4 <sup>•</sup> 1 <sup>•</sup> ○	-3
4	4 <sup>•</sup> ○	1 <sup>•</sup> -2 3 <sup>•</sup>
5	-4 -1 ○	2 <sup>•</sup> ○
6	-4 3 <sup>•</sup> -2 ○	1 <sup>•</sup>
7	-4 -3 -1 ○	
8	1 <sup>•</sup> ○ -3 -4 ○	2 <sup>•</sup>
9	2 <sup>•</sup> ○	+1 -4 3
10	-2 1 <sup>•</sup> ○	+4 -3
11	○	1 <sup>•</sup> -2 3 <sup>•</sup> -4
12	.1 3 ○	2 <sup>•</sup> -4
13	3 <sup>•</sup> 2 <sup>•</sup> ○	1 <sup>•</sup> 4 <sup>•</sup>
14	-2 ● -3 -1 ○	4 <sup>•</sup>
15	1 <sup>•</sup> ○ -3 ○	2 <sup>•</sup> 4 <sup>•</sup>
16	2 <sup>•</sup> ○	+1 -3 4 <sup>•</sup>
17	-2 1 <sup>•</sup> 4 <sup>•</sup> ○	-3
18	4 <sup>•</sup> ○	-2 3 <sup>•</sup>
19	4 <sup>•</sup> .1 ○	3 <sup>•</sup> 2 <sup>•</sup>
20	4 <sup>•</sup> 3 <sup>•</sup> 2 <sup>•</sup> ○	1 <sup>•</sup>
21	-4 -3 -1 2 ○	
22	-4 -3 ○	1 <sup>•</sup> 2 <sup>•</sup>
23	-4 2 <sup>•</sup> ○	+3 ●
24	-4 -2 1 <sup>•</sup> ○	-3
25	○	-2 3 <sup>•</sup>
26	.1 ○	3 <sup>•</sup> 2 <sup>•</sup> -4
27	3 <sup>•</sup> ○	1 <sup>•</sup> -4
28	3 <sup>•</sup> -1 2 ○	-4
29	-3 ○	1 <sup>•</sup> -2 4 <sup>•</sup>
30	2 <sup>•</sup> ○ -3 ●	○ 1 4 <sup>•</sup>
31	-3 1 <sup>•</sup> ○	-3 4 <sup>•</sup>

This Table represents, at 12<sup>h</sup> after *Mean Noon* of each day of the month, the relative position of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the page the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of the Satellites' motions, which are in all cases to be considered as *towards the numerals*. When a Satellite at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite placed by the side of it on the disc of Jupiter, and a black circle (●) that it is either *behind* the disc, or in the shadow, Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

TELLITE.	Day of the Month.	Mean Time. h m s	Sidereal Time. h m s	PHASE as seen in an inverting Telescope.
I.	2	5 12 52.2	3 53 24.2	Im.
	3	23 41 16.7	22 28 47.4	Im.
	5†	18 9 44.4	17 4 13.8	Im.
	11	3 47 51.3	3 3 38.4	Em.
	12	22 16 19.0	21 39 4.7	Em.
	14*	16 44 46.1	16 14 30.5	Em.
	16*	11 13 13.0	10 49 56.0	Em.
	18	5 41 39.9	5 25 21.5	Em.
	20	0 10 9.1	0 0 49.4	Em.
	21	18 38 38.0	18 36 16.9	Em.
	23*	13 7 6.9	13 11 44.4	Em.
	25*	7 35 35.2	7 47 11.4	Em.
	27	2 4 6.2	2 22 41.0	Em.
	28	20 32 36.9	20 58 10.5	Em.
	30*	15 1 7.2	15 33 39.4	Em.
II.	3	20 9 6.0	18 56 1.8	Im.
	7*	9 27 49.4	8 28 46.1	Im.
	11	1 32 0.5	0 47 25.3	Em.
	14*	14 50 47.6	14 20 13.2	Em.
	18	4 8 32.0	3 51 58.3	Em.
	21†	17 27 24.6	17 24 51.8	Em.
	25†	6 45 13.1	6 56 41.1	Em.
	28	20 4 10.4	20 29 39.3	Em.
III.	1	18 49 55.6	17 28 45.4	Im.
	9	2 1 35.8	1 9 12.3	Em.
	16	5 58 56.1	5 34 47.4	Em.
	23*	9 56 45.0	10 0 51.3	Em.
	30*	13 54 39.2	14 27 0.4	Em.
IV.	8	22 10 12.7	21 17 11.2	Im.
	9	1 41 59.8	0 49 33.1	Em.
	25*	16 11 17.2	16 24 18.1	Im.
	25	19 35 57.7	19 49 32.2	Em.





APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHADOWS.	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Egress.
I.	d h m	d h m	d h m	d h m	d h m	d h m
	In the	2* 6 18	1* 6 41	1* 8 59	1* 6 30	1* 8
	Shadow.	4 0 51	3 1 14	3 3 31	3 1 6	3 3
		5 19 24	4 19 47	4 22 5	4 19 41	4 22
	7* 11 39	7* 13 57	6* 14 20	6* 16 37	6* 14 17	6* 16
	9* 6 12	9* 8 29	8* 8 53	8* 11 10	8* 8 52	8* 11
	11 0 45		10 3 26	10† 5 43	10 3 28	10† 5
	12 19 17		11 21 59	12 0 17	11 22 4	12 0
	14* 13 50		13* 16 32	13 18 49	13* 16 39	13 18
	16* 8 23	In	15* 11 5	15* 13 23	15* 11 15	15* 13
	18 2 56		17 5 38	17* 7 55	17† 5 50	17* 8
	19 21 29	the	19 0 11	19 2 29	19 0 26	19 2
	21* 16 2		20 18 44	20 21 1	20 19 1	20 21
	23* 10 35	Shadow.	22* 13 17	22* 15 35	22* 13 37	22* 15
	25 5 8		24* 7 50	24* 10 8	24* 8 13	24* 10
	26 23 41		26 2 24	26 4 41	26 2 49	26 5
	28 18 14		27 20 57	27 23 15	27 21 24	27 23
	30* 12 47		29* 15 30	29† 17 48	29* 16 0	29 18
			31* 10 3	31* 12 21	31* 10 35	31* 12
II.	In the	3 21 57	2 0 42	2 3 30	2 0 22	2 3
	Shadow.	7* 11 19	5* 14 3	5† 16 50	5* 13 53	5* 16
	10 21 53		9 3 23	9* 6 10	9 3 23	9* 6
	14* 11 15	In	12* 16 43	12 19 31	12† 16 54	12 19
	18 0 36		16† 6 3	16* 8 51	16† 6 25	16* 9
	21* 13 59	the	19 19 23	19 22 12	19 19 56	19 22
	25 3 21		23* 8 44	23* 11 32	23* 9 27	23* 12
	28* 16 44	Shadow.	26 22 5	27 0 53	26 22 58	27 1
III.	In the Shadow.	1 21 24	5* 7 49	5* 11 5	5* 7 25	5* 10
	8 21 51		12* 11 33	12* 14 50	12* 11 53	12* 15
	16 1 34	In the	19* 15 18	19 18 36	19* 16 20	19 19
	23 5 19	Shadow.	26 19 4	26 22 23	26 20 47	26 0
	30* 9 6					
IV.	25* 12 38	25* 15 55	17 3 13	17† 6 23	17 4 54	17* 8

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time		Mean Equinoctial Time, 0 <sup>d</sup> 57 <sup>m</sup> 17 <sup>s</sup> 90 adding 66-623573	From Mean Noon of January 1.		
	At Mean Midnight,				of Transit			Day of the Year.	Fraction of the Year.	
	Logarithm of				of the					
	A	B	C	D	First Point of Aries.					
					<sup>h</sup> 1	<sup>m</sup> 24	<sup>s</sup> 2 09	Days.		
1	-1 2485	+0 8207	-8 5118	+0 8441	1	24	2 09	343	59	.162
2	1 2510	0 7979	8 4873	0 8430	1	20	6 18	344	60	.164
3	1 2534	0 7737	8 4615	0 8420	1	16	10 27	345	61	.167
4	-1 2557	+0 7479	-8 4344	+0 8410	1	12	14 37	346	62	.170
5	1 2577	0 7204	8 4059	0 8401	1	8	18 46	347	63	.172
6	1 2597	0 6909	8 3755	0 8392	1	4	22 55	348	64	.175
7	-1 2615	+0 6591	-8 3430	+0 8383	1	0	26 65	349	65	.178
8	1 2632	0 6246	8 3084	0 8375	0	56	30 74	350	66	.181
9	1 2647	0 5871	8 2709	0 8367	0	52	34 83	351	67	.183
10	-1 2661	+0 5459	-8 2302	+0 8359	0	48	38 93	352	68	.186
11	1 2673	0 5002	8 1855	0 8352	0	44	43 02	353	69	.189
12	1 2684	0 4491	8 1361	0 8345	0	40	47 12	354	70	.192
13	-1 2694	+0 3910	-8 0806	+0 8338	0	36	51 21	355	71	.194
14	1 2703	0 3238	8 0170	0 8332	0	32	55 30	356	72	.197
15	1 2710	0 2441	7 9425	0 8326	0	28	59 40	357	73	.200
16	-1 2716	+0 1461	-7 8531	+0 8321	0	25	3 49	358	74	.203
17	1 2720	0 0200	7 7404	0 8316	0	21	7 58	359	75	.205
18	1 2724	9 8410	7 5888	0 8312	0	17	11 68	360	76	.208
19	-1 2725	+9 5310	-7 3541	+0 8308	0	13	15 77	361	77	.211
20	1 2726	-8 1467	-6 8062	0 8304	0	9	19 87	362	78	.214
21	1 2725	9 5652	+6 9956	0 8301	0	5	23 96	363	79	.216
22	-1 2723	-9 8576	+7 4183	+0 8298	{ 0 23 1 20 20 05 }			364	80	.219
23	1 2720	0 0306	7 6263	0 8295	23 53 36 24			0	81	.222
24	1 2715	0 1539	7 7679	0 8293	23 49 40 33			1	82	.225
25	-1 2710	-0 2496	+7 8751	+0 8292	23 45 44 43			2	83	.227
26	1 2702	0 3278	7 9614	0 8291	23 41 48 52			3	84	.230
27	1 2694	0 3939	8 0334	0 8290	23 37 52 62			4	85	.233
28	-1 2684	-0 4512	+8 0955	+0 8289	23 33 56 71			5	86	.235
29	1 2673	0 5016	8 1498	0 8289	23 30 0 80			6	87	.238
30	1 2661	0 5466	8 1987	0 8290	23 26 4 90			7	88	.241
31	1 2647	0 5873	8 2428	0 8291	23 22 8 99			8	89	.244
32	-1 2632	-0 6243	+8 2829	+0 8292	23 18 13 08			9	90	.246



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be added to subtr. from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		h m s	s	° ' "	"	m s	m s	s
Mon.	1	0 41 56.98	9.095	N. 4 30 58.2	57.73	1 4.42	3 59.10	0.7
Tues.	2	0 45 35.25	9.100	4 54 3.6	57.51	1 4.44	3 40.87	0.3
Wed.	3	0 49 13.66	9.107	5 17 3.8	57.28	1 4.46	3 22.78	0.7
Thur.	4	0 52 52.24	9.115	5 39 58.6	57.04	1 4.48	3 4.85	0.7
Frid.	5	0 56 31.00	9.123	6 2 47.6	56.78	1 4.51	2 47.10	0.7
Sat.	6	1 0 9.96	9.132	6 25 30.4	56.51	1 4.53	2 29.56	0.7
Sun.	7	1 3 49.13	9.142	6 48 6.7	56.23	1 4.56	2 12.23	0.7
Mon.	8	1 7 28.54	9.152	7 10 36.1	55.93	1 4.59	1 55.14	0.7
Tues.	9	1 11 8.20	9.163	7 32 58.4	55.61	1 4.63	1 38.29	0.6
Wed.	10	1 14 48.12	9.175	7 55 13.1	55.28	1 4.67	1 21.70	0.6
Thur.	11	1 18 28.31	9.187	8 17 19.8	54.94	1 4.71	1 5.39	0.6
Frid.	12	1 22 8.80	9.200	8 39 18.3	54.58	1 4.75	0 49.37	0.6
Sat.	13	1 25 49.59	9.213	9 1 8.3	54.21	1 4.80	0 33.65	0.6
Sun.	14	1 29 30.70	9.226	9 22 49.3	53.82	1 4.85	0 18.24	0.6
Mon.	15	1 33 12.13	9.240	9 44 20.9	53.41	1 4.90	0 3.16	0.6
Tues.	16	1 36 53.89	9.255	10 5 42.8	53.00	1 4.95	0 11.59	0.6
Wed.	17	1 40 36.01	9.270	10 26 54.7	52.56	1 5.01	0 25.98	0.6
Thur.	18	1 44 18.50	9.286	10 47 56.2	52.12	1 5.07	0 40.01	0.6
Frid.	19	1 48 1.36	9.302	11 8 47.0	51.65	1 5.13	0 53.66	0.6
Sat.	20	1 51 44.62	9.319	11 29 26.7	51.18	1 5.19	1 6.92	0.6
Sun.	21	1 55 28.28	9.337	11 49 55.0	50.69	1 5.26	1 19.78	0.6
Mon.	22	1 59 12.36	9.355	12 10 11.6	50.19	1 5.32	1 32.22	0.6
Tues.	23	2 2 56.88	9.373	12 30 16.2	49.68	1 5.39	1 44.23	0.6
Wed.	24	2 6 41.84	9.393	12 50 8.4	49.15	1 5.46	1 55.78	0.6
Thur.	25	2 10 27.27	9.413	13 9 48.0	48.61	1 5.53	2 6.87	0.6
Frid.	26	2 14 13.18	9.434	13 29 14.6	48.06	1 5.60	2 17.48	0.6
Sat.	27	2 17 59.59	9.455	13 48 28.0	47.49	1 5.67	2 27.61	0.6
Sun.	28	2 21 46.51	9.476	14 7 27.7	46.91	1 5.74	2 37.22	0.6
Mon.	29	2 25 33.94	9.499	14 26 13.5	46.32	1 5.82	2 46.31	0.6
Tues.	30	2 29 21.91	9.521	14 44 45.2	45.72	1 5.89	2 54.87	0.6
Wed.	31	2 33 10.42		N. 15 3 2.4		1 5.97	3 2.89	

\* Mean Time of the Semidiameter passing may be found by subtracting 0.18 from the Sidereal Time.

## AT MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S			Equation of Time, to be subt. from added to Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		h m s	° ' "	' "	m s	h m s
on.	1	0 41 56.37	N. 4 30 54.3	16 0.9	3 59.15	0 37 57.23
ues.	2	0 45 34.69	4 54 0.0	16 0.6	3 40.91	0 41 53.78
ed.	3	0 49 13.15	5 17 0.6	16 0.3	3 22.82	0 45 50.33
hur.	4	0 52 51.77	5 39 55.7	16 0.0	3 4.89	0 49 46.88
rid.	5	0 56 30.57	6 2 44.9	15 59.7	2 47.14	0 53 43.44
at.	6	1 0 9.58	6 25 28.0	15 59.5	2 29.59	0 57 39.99
un.	7	1 3 48.80	6 48 4.6	15 59.2	2 12.26	1 1 36.54
on.	8	1 7 28.25	7 10 34.3	15 58.9	1 55.16	1 5 33.09
ues.	9	1 11 7.95	7 32 56.9	15 58.6	1 38.31	1 9 29.65
ed.	10	1 14 47.91	7 55 11.8	15 58.4	1 21.72	1 13 26.20
hur.	11	1 18 28.15	8 17 18.8	15 58.1	1 5.40	1 17 22.75
rid.	12	1 22 8.68	8 39 17.6	15 57.8	0 49.37	1 21 19.30
at.	13	1 25 49.51	9 1 7.8	15 57.6	0 33.65	1 25 15.85
un.	14	1 29 30.65	9 22 49.0	15 57.3	0 18.24	1 29 12.41
on.	15	1 33 12.12	9 44 20.8	15 57.0	0 3.16	1 33 8.96
ues.	16	1 36 53.92	10 5 42.9	15 56.8	0 11.59	1 37 5.51
ed.	17	1 40 36.08	10 26 55.0	15 56.5	0 25.99	1 41 2.07
hur.	18	1 44 18.60	10 47 56.7	15 56.3	0 40.02	1 44 58.62
rid.	19	1 48 1.50	11 8 47.7	15 56.0	0 53.67	1 48 55.17
at.	20	1 51 44.79	11 29 27.6	15 55.7	1 6.93	1 52 51.73
un.	21	1 55 28.49	11 49 56.1	15 55.5	1 19.79	1 56 48.28
on.	22	1 59 12.60	12 10 12.9	15 55.3	1 32.23	2 0 44.83
ues.	23	2 2 57.15	12 30 17.6	15 55.0	1 44.24	2 4 41.39
ed.	24	2 6 42.15	12 50 10.0	15 54.7	1 55.80	2 8 37.94
hur.	25	2 10 27.61	13 9 49.7	15 54.5	2 6.89	2 12 34.49
rid.	26	2 14 13.55	13 29 16.4	15 54.3	2 17.50	2 16 31.05
at.	27	2 17 59.98	13 48 29.9	15 54.0	2 27.62	2 20 27.60
un.	28	2 21 46.92	14 7 29.8	15 53.8	2 37.23	2 24 24.16
on.	29	2 25 34.38	14 26 15.7	15 53.5	2 46.33	2 28 20.71
ues.	30	2 29 22.37	14 44 47.4	15 53.3	2 54.89	2 32 17.26
ed.	31	2 33 10.91	N. 15 3 4.6	15 53.0	3 2.91	2 36 13.82

\* The Semidiameter for Apparent Noon may be assumed the same as that for Mean Noon.



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax.	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Midnight.
1	11 24 20.6	N.0° 70'	0.0000127	15 4.9	15 0.3	55 20.6	55 4
2	12 23 26.3	0° 67'	0.0001402	14 56.4	14 53.0	54 49.4	54 36
3	13 22 30.3	0° 60'	0.0002679	14 50.2	14 48.2	54 26.9	54 19
4	14 21 32.4	0° 51'	0.0003956	14 46.9	14 46.2	54 14.5	54 12
5	15 20 32.8	0° 40'	0.0005231	14 46.4	14 47.1	54 12.7	54 15
6	16 19 31.5	0° 28'	0.0006503	14 48.6	14 50.7	54 20.8	54 28
7	17 18 28.4	0° 14'	0.0007770	14 53.5	14 56.8	54 38.8	54 51
8	18 17 23.5	N.0° 01'	0.0009030	15 0.6	15 4.8	55 5.0	55 20
9	19 16 16.9	S.0° 12'	0.0010282	15 9.4	15 14.3	55 37.3	55 55
10	20 15 8.3	0° 24'	0.0011524	15 19.4	15 24.6	56 14.0	56 33
11	21 13 57.8	0° 33'	0.0012757	15 29.8	15 34.9	56 52.0	57 10
12	22 12 45.4	0° 40'	0.0013980	15 39.8	15 44.5	57 28.9	57 46
13	23 11 31.1	0° 44'	0.0015192	15 48.8	15 52.8	58 2.0	58 16
14	24 10 14.6	0° 46'	0.0016394	15 56.5	15 59.5	58 29.7	58 41
15	25 8 56.0	0° 44'	0.0017585	16 2.2	16 4.4	58 51.1	58 58
16	26 7 35.2	0° 39'	0.0018765	16 6.1	16 7.3	59 5.2	59 9
17	27 6 12.2	0° 31'	0.0019936	16 8.2	16 8.7	59 13.1	59 14
18	28 4 47.1	0° 21'	0.0021099	16 8.8	16 8.7	59 15.4	59 14
19	29 3 19.8	S.0° 10'	0.0022253	16 8.2	16 7.4	59 13.1	59 10
20	30 1 50.2	N.0° 03'	0.0023400	16 6.3	16 4.9	59 6.1	59 6
21	31 0 18.5	0° 17'	0.0024542	16 3.2	16 1.1	58 54.6	58 46
22	31 58 44.7	0° 30'	0.0025678	15 58.7	15 55.9	58 38.0	58 27
23	32 57 8.7	0° 42'	0.0026810	15 52.7	15 49.3	58 16.2	58 3
24	33 55 30.7	0° 52'	0.0027939	15 45.5	15 41.4	57 49.6	57 31
25	34 53 50.7	0° 60'	0.0029065	15 37.0	15 32.5	57 18.7	57 4
26	35 52 8.9	0° 66'	0.0030188	15 27.9	15 23.2	56 45.1	56 27
27	36 50 25.2	0° 69'	0.0031307	15 18.5	15 13.8	56 10.5	55 53
28	37 48 39.8	0° 69'	0.0032422	15 9.2	15 5.0	55 36.7	55 22
29	38 46 52.7	0° 66'	0.0033532	15 1.0	14 57.3	55 6.4	54 53
30	39 45 4.0	0° 60'	0.0034637	14 54.1	14 51.3	54 40.9	54 33
31	40 43 13.8	N.0° 51'	0.0035735	14 49.2	14 47.5	54 23.0	54 11

## MEAN TIME.

Day of the Week.	Day of the Month.	THE MOON'S					
		Longitude.		Latitude.		Age.	Meridian
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.
Mon.	1	246 26 44.6	252 37 8.7	N.4 59 2.2	N.4 49 19.4	18.5	16 15.6
Tues.	2	258 43 34.9	264 46 32.7	4 36 24.2	4 20 29.6	19.5	17 4.0
Wed.	3	270 46 34.4	276 44 15.5	4 1 49.7	3 40 38.2	20.5	17 52.1
Thur.	4	282 40 12.9	288 35 5.7	3 17 9.9	2 51 38.3	21.5	18 39.9
Frid.	5	294 29 33.1	300 24 15.2	2 24 18.7	1 55 25.2	22.5	19 27.1
Sat.	6	306 19 51.7	312 17 1.3	1 25 13.0	N.0 53 58.5	23.5	20 13.7
Sun.	7	318 16 21.8	324 18 28.4	N.0 21 58.1	S.0 10 29.8	24.5	20 59.8
Mon.	8	330 23 53.8	336 33 7.2	S.0 43 6.4	1 15 31.0	25.5	21 45.6
Tues.	9	342 46 34.3	349 4 35.2	1 47 21.1	2 18 13.1	26.5	22 31.6
Wed.	10	355 27 25.1	1 55 13.0	2 47 42.7	3 15 23.7	27.5	23 18.2
Thur.	11	8 28 1.6	15 5 47.4	3 40 49.9	4 3 34.7	28.5	♂
Frid.	12	21 48 20.4	28 35 23.9	4 23 13.2	4 39 21.3	29.5	0 6.1
Sat.	13	35 26 36.0	42 21 30.0	4 51 38.0	4 59 45.3	1.0	0 55.8
Sun.	14	49 19 36.2	56 20 21.5	5 3 29.8	5 2 42.3	2.0	1 47.8
Mon.	15	63 23 12.6	70 27 38.0	4 57 19.2	4 47 22.5	3.0	2 42.2
Tues.	16	77 33 5.3	84 39 5.7	4 32 58.8	4 14 21.2	4.0	3 39.0
Wed.	17	91 45 15.0	98 51 11.3	3 51 46.6	3 25 37.1	5.0	4 37.2
Thur.	18	105 56 38.1	113 1 22.0	2 56 18.1	2 24 18.3	6.0	5 35.8
Frid.	19	120 5 12.5	127 8 2.0	1 50 9.0	1 14 23.4	7.0	6 33.6
Sat.	20	134 9 44.6	141 10 14.2	S.0 37 35.7	S.0 0 20.7	8.0	7 29.5
Sun.	21	148 9 25.9	155 7 13.2	N.0 36 46.1	N.1 13 11.0	9.0	8 23.2
Mon.	22	162 3 28.1	168 58 0.6	1 48 20.3	2 21 43.1	10.0	9 14.8
Tues.	23	175 50 39.2	182 41 9.9	2 52 49.1	3 21 13.4	11.0	10 4.7
Wed.	24	189 29 17.1	196 14 44.0	3 46 33.4	4 8 29.3	12.0	10 53.5
Thur.	25	202 57 13.2	209 36 28.2	4 26 47.0	4 41 16.0	13.0	11 41.7
Frid.	26	216 12 13.0	222 44 14.6	4 51 50.0	4 58 26.4	14.0	12 29.8
Sat.	27	229 12 22.0	235 36 28.7	5 1 7.1	4 59 57.6	15.0	13 18.1
Sun.	28	241 56 32.3	248 12 35.0	4 55 5.0	4 46 40.1	16.0	14 6.8
Mon.	29	254 24 43.8	260 33 11.3	4 34 56.0	4 20 5.3	17.0	14 55.6
Tues.	30	266 38 13.9	272 40 13.3	4 2 23.4	3 42 5.8	18.0	15 44.4
Wed.	31	278 39 35.1	284 36 48.7	N.3 19 27.7	N.2 54 45.5	19.0	16 32.7



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 1.				WEDNESDAY 3.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	16 21 52.65	S. 16 29 17.5	57.48	0	18 3 16.99	S. 19 25 27.4	14.97
1	16 23 59.41	16 35 2.4	56.63	1	18 5 23.51	19 26 54.2	13.97
2	16 26 6.18	16 40 42.2	55.77	2	18 7 30.01	19 28 15.6	12.93
3	16 28 12.96	16 46 16.8	54.93	3	18 9 36.49	19 29 31.4	11.72
4	16 30 19.74	16 51 46.4	54.05	4	18 11 42.94	19 30 41.7	10.38
5	16 32 26.53	16 57 10.7	53.20	5	18 13 49.36	19 31 46.5	9.91
6	16 34 33.32	17 2 29.9	52.35	6	18 15 55.77	19 32 45.8	8.97
7	16 36 40.12	17 7 44.0	51.47	7	18 18 2.14	19 33 39.6	8.03
8	16 38 46.92	17 12 52.8	50.60	8	18 20 8.49	19 34 27.9	7.12
9	16 40 53.73	17 17 56.4	49.72	9	18 22 14.81	19 35 10.6	6.22
10	16 43 0.54	17 22 54.7	48.85	10	18 24 21.10	19 35 47.9	5.30
11	16 45 7.35	17 27 47.8	47.98	11	18 26 27.36	19 36 19.7	4.37
12	16 47 14.17	17 32 35.7	47.10	12	18 28 33.58	19 36 45.9	3.47
13	16 49 20.99	17 37 18.3	46.20	13	18 30 39.77	19 37 6.7	2.52
14	16 51 27.81	17 41 55.5	45.33	14	18 32 45.92	19 37 21.9	1.61
15	16 53 34.64	17 46 27.5	44.43	15	18 34 52.04	19 37 31.7	0.72
16	16 55 41.46	17 50 54.1	43.55	16	18 36 58.12	19 37 36.0	0.28
17	16 57 48.29	17 55 15.4	42.67	17	18 39 4.17	19 37 34.8	1.12
18	16 59 55.11	17 59 31.4	41.77	18	18 41 10.18	19 37 28.1	2.02
19	17 2 1.94	18 3 42.0	40.88	19	18 43 16.15	19 37 16.0	2.35
20	17 4 8.77	18 7 47.3	39.98	20	18 45 22.09	19 36 58.3	3.22
21	17 6 15.59	18 11 47.2	39.08	21	18 47 27.99	19 36 35.2	4.75
22	17 8 22.42	18 15 41.7	38.20	22	18 49 33.85	19 36 6.7	5.68
23	17 10 29.24	S. 18 19 30.9	37.28	23	18 51 39.67	S. 19 35 32.6	6.37
TUESDAY 2.				THURSDAY 4.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	17 12 36.06	S. 18 23 14.6	36.38	0	18 53 45.45	S. 19 34 53.2	7.43
1	17 14 42.88	18 26 52.9	35.50	1	18 55 51.19	19 34 8.3	8.40
2	17 16 49.69	18 30 25.9	34.58	2	18 57 56.90	19 33 17.9	9.36
3	17 18 56.49	18 33 53.4	33.67	3	19 0 2.56	19 32 22.1	10.20
4	17 21 3.29	18 37 15.4	32.78	4	19 2 8.18	19 31 20.9	11.10
5	17 23 10.09	18 40 32.1	31.87	5	19 4 13.75	19 30 14.3	12.00
6	17 25 16.87	18 43 43.3	30.95	6	19 6 19.28	19 29 2.2	12.90
7	17 27 23.65	18 46 49.0	30.05	7	19 8 24.77	19 27 44.8	13.80
8	17 29 30.42	18 49 49.3	29.13	8	19 10 30.20	19 26 22.0	14.70
9	17 31 37.19	18 52 44.1	28.22	9	19 12 35.59	19 24 53.8	15.60
10	17 33 43.94	18 55 33.4	27.32	10	19 14 40.94	19 23 20.2	16.48
11	17 35 50.68	18 58 17.3	26.40	11	19 16 46.23	19 21 41.3	17.38
12	17 37 57.41	19 0 55.7	25.48	12	19 18 51.48	19 19 57.0	18.27
13	17 40 4.12	19 3 28.6	24.57	13	19 20 56.67	19 18 7.4	19.17
14	17 42 10.82	19 5 56.0	23.65	14	19 23 1.81	19 16 12.4	20.03
15	17 44 17.51	19 8 17.9	22.73	15	19 25 6.90	19 14 12.2	20.93
16	17 46 24.19	19 10 34.3	21.82	16	19 27 11.93	19 12 6.6	21.82
17	17 48 30.85	19 12 45.2	20.90	17	19 29 16.92	19 9 55.7	22.68
18	17 50 37.49	19 14 50.6	19.98	18	19 31 21.85	19 7 39.6	23.58
19	17 52 44.12	19 16 50.5	19.07	19	19 33 26.72	19 5 18.1	24.43
20	17 54 50.73	19 18 44.9	18.15	20	19 35 31.54	19 2 51.5	25.33
21	17 56 57.32	19 20 33.8	17.23	21	19 37 36.31	19 0 19.5	26.20
22	17 59 3.90	19 22 17.2	16.30	22	19 39 41.02	18 57 42.3	27.07
23	18 1 10.45	19 23 55.0	15.40	23	19 41 45.68	18 54 59.9	27.93
24	18 3 16.99	S. 19 25 27.4		24	19 43 50.28	S. 18 52 12.3	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

ht Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 5.			SUNDAY 7.			
m s	° ' "	"	h m s	° ' "	"	
43 50.28	S. 18 52 12.3	28.80	0 21 22 23.01	S. 15 0 54.8	67.20	
45 54.83	18 49 19.5	29.67	1 21 24 24.84	14 54 11.6	67.90	
47 59.32	18 46 21.5	30.53	2 21 26 26.62	14 47 24.2	68.63	
50 3.75	18 43 18.3	31.40	3 21 28 28.35	14 40 32.4	69.33	
52 8.13	18 40 9.9	32.25	4 21 30 30.04	14 33 36.4	70.03	
54 12.45	18 36 56.4	33.10	5 21 32 31.68	14 26 36.2	70.73	
56 16.71	18 33 37.8	33.95	6 21 34 33.28	14 19 31.8	71.43	
58 20.91	18 30 14.1	34.82	7 21 36 34.84	14 12 23.2	72.13	
0 25.06	18 26 45.2	35.65	8 21 38 36.35	14 5 10.4	72.82	
2 29.14	18 23 11.3	36.52	9 21 40 37.82	13 57 53.5	73.50	
4 33.17	18 19 32.2	37.35	10 21 42 39.26	13 50 32.5	74.18	
6 37.14	18 15 48.1	38.18	11 21 44 40.65	13 43 7.4	74.85	
8 41.05	18 11 59.0	39.03	12 21 46 42.01	13 35 38.3	75.52	
10 44.90	18 8 4.8	39.87	13 21 48 43.33	13 28 5.2	76.20	
12 48.69	18 4 5.6	40.68	14 21 50 44.61	13 20 28.0	76.85	
14 52.42	18 0 1.5	41.53	15 21 52 45.86	13 12 46.9	77.50	
16 56.10	17 55 52.3	42.37	16 21 54 47.07	13 5 1.9	78.17	
18 59.71	17 51 38.1	43.18	17 21 56 48.25	12 57 12.9	78.80	
21 3.26	17 47 19.0	44.00	18 21 58 49.40	12 49 20.1	79.45	
23 6.76	17 42 55.0	44.82	19 22 0 50.52	12 41 23.4	80.08	
25 10.19	17 38 26.1	45.65	20 22 2 51.61	12 33 22.9	80.72	
27 13.56	17 33 52.2	46.45	21 22 4 52.67	12 25 18.6	81.35	
29 16.88	17 29 13.5	47.27	22 22 6 53.71	12 17 10.5	81.98	
31 20.13	S. 17 24 29.9	48.08	23 22 8 54.72	S. 12 8 58.6	82.58	
SATURDAY 6.			MONDAY 8.			
33 23.33	S. 17 19 41.4	48.88	0 22 10 55.71	S. 12 0 43.1	83.20	
35 26.47	17 14 48.1	49.68	1 22 12 56.68	11 52 23.9	83.82	
37 29.55	17 9 50.0	50.48	2 22 14 57.62	11 44 1.0	84.42	
39 32.57	17 4 47.1	51.28	3 22 16 58.55	11 35 34.5	85.02	
41 35.53	16 59 39.4	52.07	4 22 18 59.45	11 27 4.4	85.62	
43 38.43	16 54 27.0	52.87	5 22 21 0.34	11 18 30.7	86.18	
45 41.27	16 49 9.8	53.65	6 22 23 1.22	11 9 53.6	86.78	
47 44.06	16 43 47.9	54.42	7 22 25 2.08	11 1 12.9	87.37	
49 46.79	16 38 21.4	55.22	8 22 27 2.93	10 52 28.7	87.93	
51 49.46	16 32 50.1	55.98	9 22 29 3.76	10 43 41.1	88.50	
53 52.08	16 27 14.2	56.75	10 22 31 4.59	10 34 50.1	89.07	
55 54.64	16 21 33.7	57.53	11 22 33 5.41	10 25 55.7	89.62	
57 57.14	16 15 48.5	58.28	12 22 35 6.23	10 16 58.0	90.17	
59 59.59	16 9 58.8	59.05	13 22 37 7.04	10 7 57.0	90.72	
2 1.98	16 4 4.5	59.82	14 22 39 7.85	9 58 52.7	91.27	
4 4.32	15 58 5.6	60.57	15 22 41 8.66	9 49 45.1	91.78	
6 6.60	15 52 2.2	61.30	16 22 43 9.46	9 40 34.4	92.33	
8 8.83	15 45 54.4	62.07	17 22 45 10.27	9 31 20.4	92.83	
10 11.01	15 39 42.0	62.80	18 22 47 11.09	9 22 3.4	93.37	
12 13.14	15 33 25.2	63.55	19 22 49 11.91	9 12 43.2	93.88	
14 15.21	15 27 3.9	64.28	20 22 51 12.73	9 3 19.9	94.37	
16 17.23	15 20 38.2	65.02	21 22 53 13.57	8 53 53.7	94.88	
18 19.21	15 14 8.1	65.75	22 22 55 14.42	8 44 24.4	95.37	
20 21.13	15 7 33.6	66.47	23 22 57 15.28	8 34 52.2	95.87	
22 23.01	S. 15 0 54.8		24 22 59 16.15	S. 8 25 17.0		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .
TUESDAY 9.				THURSDAY 11.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	22 59 16.15	S. 8 25 17.0	96.33	0	0 36 54.43	S. 0 1 22.1	110.9
1	23 1 17.04	8 15 39.0	96.32	1	0 38 58.53	N. 0 9 43.8	111.9
2	23 3 17.95	8 5 58.1	97.28	2	0 41 2.76	0 20 50.2	111.9
3	23 5 18.87	7 56 14.4	97.75	3	0 43 7.11	0 31 57.3	111.9
4	23 7 19.82	7 46 27.9	98.20	4	0 45 11.58	0 43 4.8	111.9
5	23 9 20.79	7 36 38.7	98.65	5	0 47 16.19	0 54 12.8	111.9
6	23 11 21.79	7 26 46.8	99.10	6	0 49 20.93	1 5 21.2	111.9
7	23 13 22.82	7 16 52.2	99.53	7	0 51 25.80	1 16 29.9	111.9
8	23 15 23.87	7 6 55.0	99.95	8	0 53 30.81	1 27 38.9	111.9
9	23 17 24.96	6 56 55.3	100.38	9	0 55 35.95	1 38 48.1	111.9
10	23 19 26.08	6 46 53.0	100.80	10	0 57 41.24	1 49 57.5	111.9
11	23 21 27.24	6 36 48.2	101.20	11	0 59 46.67	2 1 7.0	111.9
12	23 23 28.43	6 26 41.0	101.60	12	1 1 52.25	2 12 16.5	111.9
13	23 25 29.67	6 16 31.4	102.00	13	1 3 57.98	2 23 26.0	111.9
14	23 27 30.94	6 6 19.4	102.40	14	1 6 3.85	2 34 35.4	111.9
15	23 29 32.26	5 56 5.0	102.77	15	1 8 9.88	2 45 44.7	111.9
16	23 31 33.63	5 45 48.4	103.13	16	1 10 16.06	2 56 53.8	111.9
17	23 33 35.04	5 35 29.6	103.52	17	1 12 22.40	3 8 2.6	111.9
18	23 35 36.51	5 25 8.5	103.87	18	1 14 28.90	3 19 11.1	111.9
19	23 37 38.03	5 14 45.3	104.22	19	1 16 35.56	3 30 19.2	111.9
20	23 39 39.60	5 4 20.0	104.57	20	1 18 42.38	3 41 26.8	111.9
21	23 41 41.23	4 53 52.6	104.92	21	1 20 49.36	3 52 33.9	111.9
22	23 43 42.91	4 43 23.1	105.23	22	1 22 56.52	4 3 40.5	110.9
23	23 45 44.66	S. 4 32 51.7	105.55	23	1 25 3.84	N. 4 14 46.4	110.9
WEDNESDAY 10.				FRIDAY 12.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	23 47 46.47	S. 4 22 18.4	105.87	0	1 27 11.33	N. 4 25 51.6	110.9
1	23 49 48.35	4 11 43.2	106.18	1	1 29 18.99	4 36 56.0	110.9
2	23 51 50.29	4 1 6.1	106.48	2	1 31 26.82	4 47 59.6	110.9
3	23 53 52.30	3 50 27.2	106.78	3	1 33 34.83	4 59 2.3	110.9
4	23 55 54.38	3 39 46.5	107.05	4	1 35 43.02	5 10 4.0	110.9
5	23 57 56.54	3 29 4.2	107.33	5	1 37 51.40	5 21 4.7	109.9
6	23 59 58.77	3 18 20.2	107.60	6	1 39 59.95	5 32 4.3	109.9
7	0 2 1.08	3 7 34.6	107.87	7	1 42 8.69	5 43 2.7	109.9
8	0 4 3.47	2 56 47.4	108.10	8	1 44 17.61	5 53 59.9	109.9
9	0 6 5.94	2 45 58.8	108.35	9	1 46 26.73	6 4 55.8	109.9
10	0 8 8.50	2 35 8.7	108.60	10	1 48 36.04	6 15 50.3	108.9
11	0 10 11.14	2 24 17.1	108.82	11	1 50 45.54	6 26 43.4	108.9
12	0 12 13.87	2 13 24.2	109.03	12	1 52 55.23	6 37 35.0	108.9
13	0 14 16.69	2 2 30.0	109.25	13	1 55 5.12	6 48 25.0	108.9
14	0 16 19.61	1 51 34.5	109.43	14	1 57 15.22	6 59 13.4	107.9
15	0 18 22.62	1 40 37.9	109.65	15	1 59 25.51	7 10 0.0	107.9
16	0 20 25.73	1 29 40.0	109.82	16	2 1 36.00	7 20 44.9	107.9
17	0 22 28.94	1 18 41.1	110.00	17	2 3 46.70	7 31 27.9	106.9
18	0 24 32.25	1 7 41.1	110.17	18	2 5 57.61	7 42 9.1	106.9
19	0 26 35.67	0 56 40.1	110.32	19	2 8 8.72	7 52 48.2	106.9
20	0 28 39.20	0 45 38.2	110.47	20	2 10 20.04	8 3 25.3	105.9
21	0 30 42.84	0 34 35.4	110.62	21	2 12 31.57	8 14 0.2	105.9
22	0 32 46.59	0 23 31.7	110.73	22	2 14 43.32	8 24 33.0	105.9
23	0 34 50.45	0 12 27.3	110.87	23	2 16 55.28	8 35 3.5	104.9
24	0 36 54.43	S. 0 1 22.1		24	2 19 7.45	N. 8 45 31.6	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 13.				MONDAY 15.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	2 19 7.45	N. 8 45 31.6	104.28	0	4 9 21.50	N. 15 58 50.8	71.05
1	2 21 19.84	8 55 57.3	103.88	1	4 11 44.95	16 5 57.1	70.08
2	2 23 32.45	9 6 20.6	103.45	2	4 14 8.61	16 12 57.6	69.10
3	2 25 45.27	9 16 41.3	103.02	3	4 16 32.49	16 19 52.2	68.12
4	2 27 58.32	9 26 59.4	102.57	4	4 18 56.59	16 26 40.9	67.10
5	2 30 11.59	9 37 14.8	102.12	5	4 21 20.90	16 33 23.5	66.10
6	2 32 25.08	9 47 27.5	101.63	6	4 23 45.41	16 40 0.1	65.07
7	2 34 38.80	9 57 37.3	101.15	7	4 26 10.13	16 46 30.5	64.03
8	2 36 52.74	10 7 44.2	100.65	8	4 28 35.06	16 52 54.7	63.00
9	2 39 6.91	10 17 48.1	100.13	9	4 31 0.20	16 59 12.7	61.95
10	2 41 21.31	10 27 48.9	99.63	10	4 33 25.53	17 5 24.4	60.88
11	2 43 35.93	10 37 46.7	99.08	11	4 35 51.06	17 11 29.7	59.82
12	2 45 50.79	10 47 41.2	98.55	12	4 38 16.79	17 17 28.6	58.73
13	2 48 5.88	10 57 32.5	97.98	13	4 40 42.71	17 23 21.0	57.65
14	2 50 21.20	11 7 20.4	97.42	14	4 43 8.82	17 29 6.9	56.57
15	2 52 36.75	11 17 4.9	96.83	15	4 45 35.12	17 34 46.3	55.45
16	2 54 52.53	11 26 45.9	96.25	16	4 48 1.60	17 40 19.0	54.33
17	2 57 8.55	11 36 23.4	95.63	17	4 50 28.26	17 45 45.0	53.20
18	2 59 24.80	11 45 57.2	95.02	18	4 52 55.11	17 51 4.2	52.08
19	3 1 41.29	11 55 27.3	94.40	19	4 55 22.13	17 56 16.7	50.95
20	3 3 58.01	12 4 53.7	93.75	20	4 57 49.32	18 1 22.4	49.78
21	3 6 14.97	12 14 16.2	93.10	21	5 0 16.68	18 6 21.1	48.63
22	3 8 32.16	12 23 34.8	92.43	22	5 2 44.20	18 11 12.9	47.48
23	3 10 49.59	N. 12 32 49.4	91.75	23	5 5 11.89	N. 18 15 57.8	46.30
SUNDAY 14.				TUESDAY 16.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	3 13 7.26	N. 12 41 59.9	91.07	0	5 7 39.74	N. 18 20 35.6	45.12
1	3 15 25.16	12 51 6.3	90.37	1	5 10 7.75	18 25 6.3	43.95
2	3 17 43.30	13 0 8.5	89.65	2	5 12 35.90	18 29 30.0	42.73
3	3 20 1.67	13 9 6.4	88.92	3	5 15 4.20	18 33 46.4	41.55
4	3 22 20.28	13 17 59.9	88.20	4	5 17 32.65	18 37 55.7	40.33
5	3 24 39.13	13 26 49.1	87.43	5	5 20 1.24	18 41 57.7	39.13
6	3 26 58.21	13 35 33.7	86.68	6	5 22 29.97	18 45 52.5	37.92
7	3 29 17.53	13 44 13.8	85.92	7	5 24 58.83	18 49 40.0	36.68
8	3 31 37.09	13 52 49.3	85.12	8	5 27 27.82	18 53 20.1	35.45
9	3 33 56.88	14 1 20.0	84.38	9	5 29 56.93	18 56 52.8	34.22
10	3 36 16.90	14 9 46.0	83.53	10	5 32 26.17	19 0 18.1	32.98
11	3 38 37.16	14 18 7.2	82.70	11	5 34 55.52	19 3 36.0	31.73
12	3 40 57.65	14 26 23.4	81.88	12	5 37 24.99	19 6 46.4	30.48
13	3 43 18.38	14 34 34.7	81.03	13	5 39 54.57	19 9 49.3	29.22
14	3 45 39.33	14 42 40.9	80.18	14	5 42 24.25	19 12 44.6	27.97
15	3 48 0.52	14 50 42.0	79.32	15	5 44 54.03	19 15 32.4	26.70
16	3 50 21.95	14 58 37.9	78.45	16	5 47 23.91	19 18 12.6	25.43
17	3 52 43.60	15 6 28.6	77.55	17	5 49 53.88	19 20 45.2	24.15
18	3 55 5.48	15 14 13.9	76.67	18	5 52 23.94	19 23 10.1	22.87
19	3 57 27.59	15 21 53.9	75.75	19	5 54 54.08	19 25 27.3	21.60
20	3 59 49.92	15 29 28.4	74.85	20	5 57 24.29	19 27 36.9	20.30
21	4 2 12.48	15 36 57.5	73.90	21	5 59 54.58	19 29 38.7	19.02
22	4 4 35.26	15 44 20.9	72.97	22	6 2 24.94	19 31 32.8	17.72
23	4 6 58.27	15 51 38.7	72.02	23	6 4 55.36	19 33 19.1	16.43
24	4 9 21.50	N. 15 58 50.8		24	6 7 25.84	N. 19 34 57.7	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
WEDNESDAY 17.				FRIDAY 19.			
0	6 7 25.84	N.19 34 57.7	15.13	0	8 7 27.36	N.18 21 9.1	46
1	6 9 56.38	19 36 28.5	13.82	1	8 9 55.15	18 16 32.1	47
2	6 12 26.96	19 37 51.4	12.53	2	8 12 22.79	18 11 48.0	48
3	6 14 57.60	19 39 6.6	11.22	3	8 14 50.27	18 6 57.0	49
4	6 17 28.27	19 40 13.9	9.90	4	8 17 17.59	18 1 59.0	50
5	6 19 58.98	19 41 13.3	8.62	5	8 19 44.75	17 56 54.0	51
6	6 22 29.72	19 42 5.0	7.28	6	8 22 11.74	17 51 42.2	52
7	6 25 0.48	19 42 48.7	5.98	7	8 24 38.56	17 46 23.6	53
8	6 27 31.27	19 43 24.6	4.68	8	8 27 5.21	17 40 58.2	54
9	6 30 2.07	19 43 52.7	3.35	9	8 29 31.69	17 35 26.1	55
10	6 32 32.88	19 44 12.8	2.05	10	8 31 57.99	17 29 47.3	56
11	6 35 3.70	19 44 25.1	0.73	11	8 34 24.11	17 24 1.8	57
12	6 37 34.53	19 44 29.5	0.58	12	8 36 50.05	17 18 9.8	58
13	6 40 5.35	19 44 26.0	1.88	13	8 39 15.81	17 12 11.2	59
14	6 42 36.17	19 44 14.7	3.20	14	8 41 41.38	17 6 6.2	60
15	6 45 6.97	19 43 55.5	4.52	15	8 44 6.77	16 59 54.8	61
16	6 47 37.76	19 43 28.4	5.83	16	8 46 31.96	16 53 37.0	62
17	6 50 8.53	19 42 53.4	7.13	17	8 48 56.97	16 47 12.8	63
18	6 52 39.27	19 42 10.6	8.45	18	8 51 21.78	16 40 42.4	64
19	6 55 9.98	19 41 19.9	9.75	19	8 53 46.39	16 34 5.8	65
20	6 57 40.65	19 40 21.4	11.07	20	8 56 10.81	16 27 23.1	66
21	7 0 11.29	19 39 15.0	12.37	21	8 58 35.04	16 20 34.3	67
22	7 2 41.88	19 38 0.8	13.67	22	9 0 59.06	16 13 39.4	68
23	7 5 12.42	N.19 36 38.8	14.97	23	9 3 22.88	N.16 6 38.6	69
THURSDAY 18.				SATURDAY 20.			
0	7 7 42.91	N.19 35 9.0	16.27	0	9 5 46.50	N.15 59 31.8	72
1	7 10 13.34	19 33 31.4	17.57	1	9 8 9.92	15 52 19.2	73
2	7 12 43.71	19 31 46.0	18.85	2	9 10 33.13	15 45 0.8	74
3	7 15 14.00	19 29 52.9	20.15	3	9 12 56.14	15 37 36.7	75
4	7 17 44.23	19 27 52.0	21.43	4	9 15 18.94	15 30 6.8	76
5	7 20 14.38	19 25 43.4	22.72	5	9 17 41.54	15 22 31.4	77
6	7 22 44.46	19 23 27.1	23.98	6	9 20 3.93	15 14 50.4	78
7	7 25 14.44	19 21 3.2	25.27	7	9 22 26.11	15 7 3.9	79
8	7 27 44.34	19 18 31.6	26.53	8	9 24 48.08	14 59 11.9	80
9	7 30 14.14	19 15 52.4	27.82	9	9 27 9.84	14 51 14.6	81
10	7 32 43.85	19 13 5.5	29.07	10	9 29 31.39	14 43 12.0	82
11	7 35 13.46	19 10 11.1	30.32	11	9 31 52.73	14 35 4.1	83
12	7 37 42.96	19 7 9.2	31.58	12	9 34 13.86	14 26 51.0	84
13	7 40 12.35	19 3 59.7	32.82	13	9 36 34.78	14 18 32.8	85
14	7 42 41.63	19 0 42.8	34.07	14	9 38 55.48	14 10 9.5	86
15	7 45 10.79	18 57 18.4	35.30	15	9 41 15.98	14 1 41.2	87
16	7 47 39.83	18 53 46.6	36.53	16	9 43 36.26	13 53 8.0	88
17	7 50 8.74	18 50 7.4	37.75	17	9 45 56.34	13 44 30.0	89
18	7 52 37.53	18 46 20.9	38.98	18	9 48 16.20	13 35 47.1	90
19	7 55 6.18	18 42 27.0	40.20	19	9 50 35.84	13 26 59.5	91
20	7 57 34.70	18 38 25.8	41.40	20	9 52 55.28	13 18 7.2	92
21	8 0 3.08	18 34 17.4	42.60	21	9 55 14.51	13 9 10.3	93
22	8 2 31.32	18 30 1.8	43.80	22	9 57 33.53	13 0 8.9	94
23	8 4 59.42	18 25 39.0	44.98	23	9 59 52.33	12 51 3.1	95
24	8 7 27.36	N.18 21 9.1		24	10 2 10.93	N.12 41 52.8	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 21.				TUESDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	10 2 10.93	N. 12 41 52.8	92.43	0	11 49 20.02	N. 4 17 45.2	113.68
1	10 4 29.32	12 32 38.2	93.13	1	11 51 29.98	4 6 23.1	113.85
2	10 6 47.50	12 23 19.4	93.85	2	11 53 39.81	3 55 0.0	114.00
3	10 9 5.47	12 13 56.3	94.53	3	11 55 49.52	3 43 36.0	114.13
4	10 11 23.24	12 4 29.1	95.20	4	11 57 59.10	3 32 11.2	114.28
5	10 13 40.80	11 54 57.9	95.87	5	12 0 8.57	3 20 45.5	114.38
6	10 15 58.15	11 45 22.7	96.53	6	12 2 17.91	3 9 19.2	114.52
7	10 18 15.30	11 35 43.5	97.17	7	12 4 27.13	2 57 52.1	114.60
8	10 20 32.25	11 26 0.5	97.80	8	12 6 36.24	2 46 24.5	114.68
9	10 22 49.00	11 16 13.7	98.42	9	12 8 45.24	2 34 56.4	114.75
10	10 25 5.54	11 6 23.2	99.02	10	12 10 54.13	2 23 27.9	114.83
11	10 27 21.88	10 56 29.1	99.63	11	12 13 2.91	2 11 58.9	114.88
12	10 29 38.03	10 46 31.3	100.22	12	12 15 11.59	2 0 29.6	114.92
13	10 31 53.98	10 36 30.0	100.78	13	12 17 20.16	1 49 0.1	114.97
14	10 34 9.73	10 26 25.3	101.33	14	12 19 28.63	1 37 30.3	114.98
15	10 36 25.28	10 16 17.3	101.90	15	12 21 37.01	1 26 0.4	114.98
16	10 38 40.65	10 6 5.9	102.45	16	12 23 45.29	1 14 30.5	115.00
17	10 40 55.82	9 55 51.2	102.97	17	12 25 53.47	1 3 0.5	114.98
18	10 43 10.80	9 45 33.4	103.48	18	12 28 1.57	0 51 30.6	114.95
19	10 45 25.59	9 35 12.5	103.98	19	12 30 9.57	0 40 0.9	114.93
20	10 47 40.19	9 24 48.6	104.48	20	12 32 17.48	0 28 31.3	114.90
21	10 49 54.61	9 14 21.7	104.97	21	12 34 25.31	0 17 1.9	114.85
22	10 52 8.84	9 3 51.9	105.43	22	12 36 33.06	N. 0 5 32.8	114.77
23	10 54 22.88	N. 8 53 19.3	105.90	23	12 38 40.73	S. 0 5 55.8	114.72
MONDAY 22.				WEDNESDAY 24.			
0	10 56 36.75	N. 8 42 43.9	106.33	0	12 40 48.32	S. 0 17 24.1	114.63
1	10 58 50.44	8 32 5.8	106.78	1	12 42 55.83	0 28 51.9	114.53
2	11 1 3.94	8 21 25.1	107.20	2	12 45 3.27	0 40 19.1	114.43
3	11 3 17.28	8 10 41.9	107.62	3	12 47 10.64	0 51 45.7	114.33
4	11 5 30.44	7 59 56.2	108.03	4	12 49 17.94	1 3 11.7	114.20
5	11 7 43.42	7 49 8.0	108.42	5	12 51 25.17	1 14 36.9	114.07
6	11 9 56.24	7 38 17.5	108.78	6	12 53 32.34	1 26 1.3	113.92
7	11 12 8.88	7 27 24.8	109.17	7	12 55 39.45	1 37 24.8	113.77
8	11 14 21.36	7 16 29.8	109.53	8	12 57 46.49	1 48 47.4	113.60
9	11 16 33.68	7 5 32.6	109.85	9	12 59 53.48	2 0 9.0	113.43
10	11 18 45.83	6 54 33.5	110.20	10	13 2 0.41	2 11 29.6	113.25
11	11 20 57.82	6 43 32.3	110.53	11	13 4 7.28	2 22 49.1	113.05
12	11 23 9.65	6 32 29.1	110.83	12	13 6 14.11	2 34 7.4	112.85
13	11 25 21.33	6 21 24.1	111.13	13	13 8 20.88	2 45 24.5	112.62
14	11 27 32.85	6 10 17.3	111.43	14	13 10 27.61	2 56 40.2	112.42
15	11 29 44.22	5 59 8.7	111.70	15	13 12 34.30	3 7 54.7	112.17
16	11 31 55.44	5 47 58.5	111.97	16	13 14 40.94	3 19 7.7	111.92
17	11 34 6.51	5 36 46.7	112.22	17	13 16 47.53	3 30 19.2	111.68
18	11 36 17.43	5 25 33.4	112.47	18	13 18 54.09	3 41 29.3	111.42
19	11 38 28.21	5 14 18.6	112.70	19	13 21 0.61	3 52 37.8	111.13
20	11 40 38.85	5 3 2.4	112.92	20	13 23 7.10	4 3 44.6	110.87
21	11 42 49.34	4 51 44.9	113.12	21	13 25 13.55	4 14 49.8	110.57
22	11 44 59.70	4 40 26.2	113.32	22	13 27 19.97	4 25 53.2	110.27
23	11 47 9.93	4 29 6.3	113.52	23	13 29 26.36	4 36 54.8	109.95
24	11 49 20.02	N. 4 17 45.2		24	13 31 32.72	S. 4 47 54.5	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 25.				SATURDAY 27.			
0	13 31 32 <sup>h m s</sup> .72	S. 4 47 54 <sup>o i n</sup> .5	109 <sup>h</sup> .63	0	15 12 36 <sup>h m s</sup> .17	S. 12 42 22 <sup>o i n</sup> .1	84 <sup>h</sup> .90
1	13 33 39 <sup>h m s</sup> .06	4 58 52 <sup>o i n</sup> .3	109 <sup>h</sup> .32	1	15 14 42 <sup>h m s</sup> .93	12 50 49 <sup>o i n</sup> .2	83 <sup>h</sup> .90
2	13 35 45 <sup>h m s</sup> .37	5 9 48 <sup>o i n</sup> .2	108 <sup>h</sup> .98	2	15 16 49 <sup>h m s</sup> .72	12 59 12 <sup>o i n</sup> .0	83 <sup>h</sup> .70
3	13 37 51 <sup>h m s</sup> .67	5 20 42 <sup>o i n</sup> .1	108 <sup>h</sup> .62	3	15 18 56 <sup>h m s</sup> .55	13 7 30 <sup>o i n</sup> .6	82 <sup>h</sup> .97
4	13 39 57 <sup>h m s</sup> .94	5 31 33 <sup>o i n</sup> .8	108 <sup>h</sup> .28	4	15 21 3 <sup>h m s</sup> .40	13 15 44 <sup>o i n</sup> .8	81 <sup>h</sup> .97
5	13 42 4 <sup>h m s</sup> .19	5 42 23 <sup>o i n</sup> .5	107 <sup>h</sup> .90	5	15 23 10 <sup>h m s</sup> .29	13 23 54 <sup>o i n</sup> .8	80 <sup>h</sup> .90
6	13 44 10 <sup>h m s</sup> .43	5 53 10 <sup>o i n</sup> .9	107 <sup>h</sup> .53	6	15 25 17 <sup>h m s</sup> .21	13 32 0 <sup>o i n</sup> .4	80 <sup>h</sup> .70
7	13 46 16 <sup>h m s</sup> .65	6 3 56 <sup>o i n</sup> .1	107 <sup>h</sup> .15	7	15 27 24 <sup>h m s</sup> .16	13 40 1 <sup>o i n</sup> .6	79 <sup>h</sup> .97
8	13 48 22 <sup>h m s</sup> .86	6 14 39 <sup>o i n</sup> .0	106 <sup>h</sup> .77	8	15 29 31 <sup>h m s</sup> .14	13 47 58 <sup>o i n</sup> .4	78 <sup>h</sup> .70
9	13 50 29 <sup>h m s</sup> .06	6 25 19 <sup>o i n</sup> .6	106 <sup>h</sup> .37	9	15 31 38 <sup>h m s</sup> .15	13 55 50 <sup>o i n</sup> .7	77 <sup>h</sup> .97
10	13 52 35 <sup>h m s</sup> .24	6 35 57 <sup>o i n</sup> .8	105 <sup>h</sup> .95	10	15 33 45 <sup>h m s</sup> .20	14 3 38 <sup>o i n</sup> .5	77 <sup>h</sup> .70
11	13 54 41 <sup>h m s</sup> .42	6 46 33 <sup>o i n</sup> .5	105 <sup>h</sup> .53	11	15 35 52 <sup>h m s</sup> .28	14 11 21 <sup>o i n</sup> .8	76 <sup>h</sup> .90
12	13 56 47 <sup>h m s</sup> .59	6 57 6 <sup>o i n</sup> .7	105 <sup>h</sup> .10	12	15 37 59 <sup>h m s</sup> .39	14 19 0 <sup>o i n</sup> .5	75 <sup>h</sup> .90
13	13 58 53 <sup>h m s</sup> .75	7 7 37 <sup>o i n</sup> .3	104 <sup>h</sup> .68	13	15 40 6 <sup>h m s</sup> .53	14 26 34 <sup>o i n</sup> .6	74 <sup>h</sup> .90
14	14 0 59 <sup>h m s</sup> .91	7 18 5 <sup>o i n</sup> .4	104 <sup>h</sup> .22	14	15 42 13 <sup>h m s</sup> .71	14 34 4 <sup>o i n</sup> .1	74 <sup>h</sup> .70
15	14 3 6 <sup>h m s</sup> .07	7 28 30 <sup>o i n</sup> .7	103 <sup>h</sup> .78	15	15 44 20 <sup>h m s</sup> .92	14 41 29 <sup>o i n</sup> .0	73 <sup>h</sup> .90
16	14 5 12 <sup>h m s</sup> .23	7 38 53 <sup>o i n</sup> .4	103 <sup>h</sup> .32	16	15 46 28 <sup>h m s</sup> .15	14 48 49 <sup>o i n</sup> .1	72 <sup>h</sup> .90
17	14 7 18 <sup>h m s</sup> .39	7 49 13 <sup>o i n</sup> .3	102 <sup>h</sup> .85	17	15 48 35 <sup>h m s</sup> .42	14 56 4 <sup>o i n</sup> .6	71 <sup>h</sup> .70
18	14 9 24 <sup>h m s</sup> .55	7 59 30 <sup>o i n</sup> .4	102 <sup>h</sup> .37	18	15 50 42 <sup>h m s</sup> .72	15 3 15 <sup>o i n</sup> .3	70 <sup>h</sup> .90
19	14 11 30 <sup>h m s</sup> .71	8 9 44 <sup>o i n</sup> .6	101 <sup>h</sup> .88	19	15 52 50 <sup>h m s</sup> .06	15 10 21 <sup>o i n</sup> .2	70 <sup>h</sup> .70
20	14 13 36 <sup>h m s</sup> .88	8 19 55 <sup>o i n</sup> .9	101 <sup>h</sup> .40	20	15 54 57 <sup>h m s</sup> .42	15 17 22 <sup>o i n</sup> .3	69 <sup>h</sup> .97
21	14 15 43 <sup>h m s</sup> .06	8 30 4 <sup>o i n</sup> .3	100 <sup>h</sup> .88	21	15 57 4 <sup>h m s</sup> .82	15 24 18 <sup>o i n</sup> .5	68 <sup>h</sup> .97
22	14 17 49 <sup>h m s</sup> .24	8 40 9 <sup>o i n</sup> .6	100 <sup>h</sup> .38	22	15 59 12 <sup>h m s</sup> .25	15 31 9 <sup>o i n</sup> .9	67 <sup>h</sup> .70
23	14 19 55 <sup>h m s</sup> .43	S. 8 50 11 <sup>o i n</sup> .9	99 <sup>h</sup> .87	23	16 1 19 <sup>h m s</sup> .70	S. 15 37 56 <sup>o i n</sup> .4	66 <sup>h</sup> .90
FRIDAY 26.				SUNDAY 28.			
0	14 22 1 <sup>h m s</sup> .63	S. 9 0 11 <sup>o i n</sup> .1	99 <sup>h</sup> .33	0	16 3 27 <sup>h m s</sup> .19	S. 15 44 38 <sup>o i n</sup> .0	66 <sup>h</sup> .70
1	14 24 7 <sup>h m s</sup> .84	9 10 7 <sup>o i n</sup> .1	98 <sup>h</sup> .82	1	16 5 34 <sup>h m s</sup> .71	15 51 14 <sup>o i n</sup> .6	65 <sup>h</sup> .90
2	14 26 14 <sup>h m s</sup> .07	9 20 0 <sup>o i n</sup> .0	98 <sup>h</sup> .27	2	16 7 42 <sup>h m s</sup> .25	15 57 46 <sup>o i n</sup> .3	64 <sup>h</sup> .90
3	14 28 20 <sup>h m s</sup> .31	9 29 49 <sup>o i n</sup> .6	97 <sup>h</sup> .72	3	16 9 49 <sup>h m s</sup> .82	16 4 12 <sup>o i n</sup> .9	63 <sup>h</sup> .90
4	14 30 26 <sup>h m s</sup> .57	9 39 35 <sup>o i n</sup> .9	97 <sup>h</sup> .17	4	16 11 57 <sup>h m s</sup> .42	16 10 34 <sup>o i n</sup> .5	62 <sup>h</sup> .97
5	14 32 32 <sup>h m s</sup> .84	9 49 18 <sup>o i n</sup> .9	96 <sup>h</sup> .60	5	16 14 5 <sup>h m s</sup> .05	16 16 51 <sup>o i n</sup> .1	61 <sup>h</sup> .90
6	14 34 39 <sup>h m s</sup> .13	9 58 58 <sup>o i n</sup> .5	96 <sup>h</sup> .02	6	16 16 12 <sup>h m s</sup> .71	16 23 2 <sup>o i n</sup> .6	61 <sup>h</sup> .07
7	14 36 45 <sup>h m s</sup> .44	10 8 34 <sup>o i n</sup> .6	95 <sup>h</sup> .45	7	16 18 20 <sup>h m s</sup> .39	16 29 9 <sup>o i n</sup> .0	60 <sup>h</sup> .90
8	14 38 51 <sup>h m s</sup> .76	10 18 7 <sup>o i n</sup> .3	94 <sup>h</sup> .87	8	16 20 28 <sup>h m s</sup> .09	16 35 10 <sup>o i n</sup> .2	59 <sup>h</sup> .90
9	14 40 58 <sup>h m s</sup> .11	10 27 36 <sup>o i n</sup> .5	94 <sup>h</sup> .27	9	16 22 35 <sup>h m s</sup> .83	16 41 6 <sup>o i n</sup> .3	58 <sup>h</sup> .90
10	14 43 4 <sup>h m s</sup> .47	10 37 2 <sup>o i n</sup> .1	93 <sup>h</sup> .67	10	16 24 43 <sup>h m s</sup> .58	16 46 57 <sup>o i n</sup> .3	57 <sup>h</sup> .90
11	14 45 10 <sup>h m s</sup> .86	10 46 24 <sup>o i n</sup> .1	93 <sup>h</sup> .05	11	16 26 51 <sup>h m s</sup> .36	16 52 43 <sup>o i n</sup> .0	56 <sup>h</sup> .70
12	14 47 17 <sup>h m s</sup> .27	10 55 42 <sup>o i n</sup> .4	92 <sup>h</sup> .43	12	16 28 59 <sup>h m s</sup> .16	16 58 23 <sup>o i n</sup> .5	55 <sup>h</sup> .90
13	14 49 23 <sup>h m s</sup> .70	11 4 57 <sup>o i n</sup> .0	91 <sup>h</sup> .82	13	16 31 6 <sup>h m s</sup> .98	17 3 58 <sup>o i n</sup> .8	54 <sup>h</sup> .90
14	14 51 30 <sup>h m s</sup> .16	11 14 7 <sup>o i n</sup> .9	91 <sup>h</sup> .18	14	16 33 14 <sup>h m s</sup> .83	17 9 28 <sup>o i n</sup> .8	53 <sup>h</sup> .90
15	14 53 36 <sup>h m s</sup> .64	11 23 15 <sup>o i n</sup> .0	90 <sup>h</sup> .55	15	16 35 22 <sup>h m s</sup> .69	17 14 53 <sup>o i n</sup> .5	53 <sup>h</sup> .70
16	14 55 43 <sup>h m s</sup> .14	11 32 18 <sup>o i n</sup> .3	89 <sup>h</sup> .92	16	16 37 30 <sup>h m s</sup> .57	17 20 13 <sup>o i n</sup> .0	52 <sup>h</sup> .90
17	14 57 49 <sup>h m s</sup> .67	11 41 17 <sup>o i n</sup> .8	89 <sup>h</sup> .28	17	16 39 38 <sup>h m s</sup> .47	17 25 27 <sup>o i n</sup> .1	51 <sup>h</sup> .97
18	14 59 56 <sup>h m s</sup> .23	11 50 13 <sup>o i n</sup> .3	88 <sup>h</sup> .58	18	16 41 46 <sup>h m s</sup> .39	17 30 35 <sup>o i n</sup> .9	50 <sup>h</sup> .90
19	15 2 2 <sup>h m s</sup> .82	11 59 4 <sup>o i n</sup> .8	87 <sup>h</sup> .93	19	16 43 54 <sup>h m s</sup> .32	17 35 39 <sup>o i n</sup> .4	49 <sup>h</sup> .97
20	15 4 9 <sup>h m s</sup> .43	12 7 52 <sup>o i n</sup> .4	87 <sup>h</sup> .27	20	16 46 2 <sup>h m s</sup> .27	17 40 37 <sup>o i n</sup> .4	48 <sup>h</sup> .90
21	15 6 16 <sup>h m s</sup> .07	12 16 36 <sup>o i n</sup> .0	86 <sup>h</sup> .58	21	16 48 10 <sup>h m s</sup> .23	17 45 30 <sup>o i n</sup> .2	47 <sup>h</sup> .90
22	15 8 22 <sup>h m s</sup> .74	12 25 15 <sup>o i n</sup> .5	85 <sup>h</sup> .88	22	16 50 18 <sup>h m s</sup> .21	17 50 17 <sup>o i n</sup> .5	46 <sup>h</sup> .90
23	15 10 29 <sup>h m s</sup> .44	12 33 50 <sup>o i n</sup> .8	85 <sup>h</sup> .22	23	16 52 26 <sup>h m s</sup> .20	17 54 59 <sup>o i n</sup> .4	46 <sup>h</sup> .07
24	15 12 36 <sup>h m s</sup> .17	S. 12 42 22 <sup>o i n</sup> .1		24	16 54 34 <sup>h m s</sup> .20	S. 17 53 35 <sup>o i n</sup> .8	

MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 29.				TUESDAY 30.		
<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
6 54 34.20	S. 17 59 35.8	45.17	0	17 45 46.54	S. 19 22 31.9	22.87
6 56 42.21	18 4 6.8	44.27	1	17 47 54.43	19 24 49.1	21.92
6 58 50.23	18 8 32.4	43.35	2	17 50 2.30	19 27 0.6	20.98
7 0 58.26	18 12 52.5	42.43	3	17 52 10.14	19 29 6.5	20.03
7 3 6.30	18 17 7.1	41.53	4	17 54 17.96	19 31 6.7	19.10
7 5 14.34	18 21 16.3	40.60	5	17 56 25.75	19 33 1.3	18.15
7 7 22.39	18 25 19.9	39.68	6	17 58 33.52	19 34 50.2	17.20
7 9 30.44	18 29 18.0	38.75	7	18 0 41.25	19 36 33.4	16.25
7 11 38.49	18 33 10.5	37.85	8	18 2 48.96	19 38 10.9	15.32
7 13 46.54	18 36 57.6	36.92	9	18 4 56.63	19 39 42.8	14.37
7 15 54.59	18 40 39.1	35.98	10	18 7 4.28	19 41 9.0	13.43
7 18 2.64	18 44 18.0	35.05	11	18 9 11.89	19 42 29.6	12.48
7 20 10.69	18 47 45.3	34.13	12	18 11 19.46	19 43 44.5	11.53
7 22 18.73	18 51 10.1	33.18	13	18 13 27.00	19 44 53.7	10.60
7 24 26.77	18 54 29.2	32.27	14	18 15 34.49	19 45 57.3	9.67
7 26 34.80	18 57 42.8	31.33	15	18 17 41.95	19 46 55.3	8.70
7 28 42.82	19 0 50.8	30.40	16	18 19 49.37	19 47 47.5	7.78
7 30 50.84	19 3 53.2	29.45	17	18 21 56.74	19 48 34.2	6.82
7 32 58.84	19 6 49.9	28.52	18	18 24 4.07	19 49 15.1	5.90
7 35 6.83	19 9 41.0	27.58	19	18 26 11.36	19 49 50.5	4.95
7 37 14.80	19 12 26.5	26.63	20	18 28 18.60	19 50 20.2	4.00
7 39 22.76	19 15 6.3	25.70	21	18 30 25.79	19 50 44.2	3.08
7 41 30.71	19 17 40.5	24.75	22	18 32 32.94	19 51 2.7	2.13
7 43 38.63	19 20 9.0	23.82	23	18 34 40.03	19 51 15.5	1.20
7 45 46.54	S. 19 22 31.9		24	18 36 47.07	S. 19 51 22.7	

PHASES OF THE MOON.

☾ Last Quarter	4 3 44.1
● New Moon	12 0 46.8
☽ First Quarter	18 22 7.0
○ Full Moon	25 23 20.4

☾ Apogee	4 16
☾ Perigee	18 0



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
1	Jupiter W.	81 3 56	2846	82 37 24	2859	84 10 36	2870	85 43 33
	Spica $\eta$ W.	45 11 50	2937	46 43 22	2946	48 14 42	2956	49 45 50
	$\alpha$ Aquilæ E.	55 45 9	3693	54 28 14	3735	53 12 4	3782	51 56 43
	Fomalhaut E.	87 25 38	3160	85 58 41	3173	84 32 0	3186	83 5 34
	SUN E.	124 48 31	3259	123 23 31	3271	121 58 45	3282	120 34 13
2	Jupiter W.	93 24 48	2934	94 56 24	2943	96 27 49	2952	97 59 2
	Spica $\eta$ W.	57 18 40	3009	58 48 42	3017	60 18 34	3025	61 48 16
	Antares W.	14 20 43	4124	15 30 22	3931	16 43 10	3786	17 58 27
	$\alpha$ Aquilæ E.	45 53 37	4131	44 44 5	4203	43 35 42	4283	42 28 34
	Fomalhaut E.	75 57 23	3266	74 32 32	3280	73 7 57	3294	71 43 38
3	Jupiter W.	105 32 41	2996	107 2 59	3001	108 33 10	3006	110 3 13
	Spica $\eta$ W.	69 14 37	3064	70 43 31	3069	72 12 18	3074	73 41 0
	Antares W.	24 37 31	3383	26 0 7	3353	27 23 17	3329	28 46 51
	Fomalhaut E.	64 46 6	3378	63 23 24	3394	62 1 0	3408	60 38 51
	SUN E.	102 34 2	3417	101 12 5	3423	99 50 14	3430	98 28 31
4	Spica $\eta$ W.	81 3 18	3093	82 31 36	3096	83 59 51	3096	85 28 0
	Antares W.	35 50 8	3239	37 15 31	3230	38 41 5	3220	40 6 51
	Fomalhaut E.	53 52 55	3511	52 32 43	3532	51 12 54	3552	49 53 2
	SUN E.	91 41 10	3453	90 19 53	3455	88 58 38	3456	87 37 2
5	Spica $\eta$ W.	92 49 11	3095	94 17 27	3093	95 45 45	3090	97 14 0
	Antares W.	47 17 49	3177	48 44 26	3170	50 11 11	3163	51 38 0
	Fomalhaut E.	43 23 0	3717	42 6 31	3753	40 50 40	3793	39 35 31
	SUN E.	80 51 29	3455	79 30 15	3454	78 8 59	3451	76 47 41
6	Antares W.	58 54 40	3119	60 22 26	3110	61 50 23	3103	63 18 29
	$\alpha$ Pegasi E.	47 36 13	3689	46 19 14	3717	45 2 45	3747	43 46 41
	SUN E.	70 0 3	3425	68 38 15	3420	67 16 21	3414	65 54 21
7	Antares W.	70 41 43	3048	72 10 56	3038	73 40 22	3028	75 10 0
	$\alpha$ Pegasi E.	37 37 19	4025	36 26 4	4094	35 15 56	4173	34 7 0
	SUN E.	59 2 9	3367	57 39 15	3358	56 16 10	3349	54 52 51
8	Antares W.	82 41 32	2962	84 12 32	2950	85 43 47	2939	87 15 10
	$\alpha$ Aquilæ W.	41 59 11	4231	43 7 8	4143	44 16 28	4065	45 27 0
	SUN E.	47 53 44	3288	46 29 18	3276	45 4 38	3264	43 39 41
9	Antares W.	94 56 34	2866	96 29 36	2854	98 2 54	2841	99 36 29
	$\alpha$ Aquilæ W.	51 36 55	3693	52 53 50	3643	54 11 38	3597	55 30 10
	SUN E.	36 31 59	3196	35 5 45	3186	33 39 19	3175	32 12 40
14	SUN W.	25 37 37	2742	27 13 21	2729	28 49 23	2717	30 25 41
	Mars E.	54 50 24	2543	53 10 11	2538	51 29 50	2533	49 49 23
	Pollux E.	62 48 27	2432	61 5 38	2429	59 22 44	2424	57 39 44
	Regulus E.	98 25 44	2360	96 41 12	2353	94 56 29	2347	93 11 38
	Jupiter E.	114 47 50	2336	113 2 43	2330	111 17 27	2324	109 32 5
15	SUN W.	38 30 32	2662	40 8 3	2656	41 45 42	2649	43 23 30
	Mars E.	41 25 41	2512	39 44 44	2511	38 3 46	2510	36 22 47
	Pollux E.	49 4 5	2419	47 20 57	2420	45 37 51	2423	43 54 49
	Regulus E.	84 25 21	2315	82 39 44	2312	80 54 2	2308	79 8 14



## MEAN TIME.

## LUNAR DISTANCES.

Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
	° ' "		° ' "		° ' "		° ' "	
Arcturus W.	87 16 15	2893	88 48 43	2903	90 20 58	2914	91 52 59	2924
Antares W.	51 16 47	2975	52 47 31	2983	54 18 5	2992	55 48 28	3001
Alnilam E.	50 42 13	3884	49 28 37	3939	48 15 57	3999	47 4 16	4062
Alnath E.	81 39 24	3213	80 13 30	3226	78 47 52	3239	77 22 29	3253
Alnilam E.	119 9 56	3307	117 45 53	3318	116 22 2	3330	114 58 25	3340
Arcturus W.	99 30 5	2968	101 0 58	2976	102 31 41	2983	104 2 15	2989
Antares W.	63 17 49	3040	64 47 12	3046	66 16 28	3052	67 45 36	3058
Alnilam W.	19 15 42	3588	20 34 30	3519	21 54 33	3464	23 15 37	3420
Alnilam E.	41 22 46	4464	40 18 22	4566	39 15 28	4679	38 14 11	4802
Alnath E.	70 19 35	3321	68 55 48	3336	67 32 18	3350	66 9 4	3364
Alnilam E.	108 3 12	3387	106 40 41	3396	105 18 20	3403	103 56 7	3410
Arcturus W.	111 33 13	3015	113 3 6	3020	114 32 51	3024	116 2 37	3027
Antares W.	75 9 37	3083	76 38 8	3086	78 6 35	3089	79 34 58	3091
Alnilam W.	30 10 58	3290	31 35 21	3276	33 0 1	3262	34 24 58	3250
Alnath E.	59 17 3	3440	57 55 32	3457	56 34 20	3474	55 13 27	3493
Alnilam E.	97 6 53	3439	95 45 21	3443	94 23 53	3447	93 2 29	3451
Antares W.	86 56 19	3098	88 24 31	3097	89 52 41	3097	91 20 57	3096
Alnilam W.	41 32 44	3204	42 58 48	3198	44 25 0	3191	45 51 20	3183
Alnath E.	48 34 25	3599	47 15 49	3625	45 57 42	3638	44 40 5	3683
Alnilam E.	86 16 14	3458	84 55 3	3458	83 33 52	3458	82 12 41	3457
Antares W.	98 42 31	3084	100 11 0	3082	101 39 32	3077	103 8 10	3073
Alnilam W.	53 5 5	3148	54 32 16	3142	55 59 35	3134	57 27 3	3127
Alnath E.	38 21 7	3888	37 7 35	3942	35 54 58	4006	34 43 24	4076
Alnilam E.	75 26 17	3445	74 4 51	3440	72 43 20	3435	71 21 44	3431
Antares W.	64 46 46	3086	66 15 13	3076	67 43 52	3068	69 12 41	3057
Alnilam E.	42 31 26	3819	41 16 43	3862	40 2 45	3910	38 49 35	3963
Alnath E.	64 32 11	3400	63 9 54	3392	61 47 28	3385	60 24 54	3375
Antares W.	76 39 52	3007	78 9 56	2996	79 40 14	2988	81 10 46	2974
Alnilam E.	32 59 37	4366	31 53 45	4486	30 49 41	4624	29 47 37	4785
Alnath E.	53 29 29	3328	52 5 50	3319	50 42 1	3308	49 17 59	3297
Antares W.	88 47 1	2915	90 19 1	2903	91 51 16	2891	93 23 47	2878
Alnilam W.	46 38 52	3923	47 51 49	3859	49 5 51	3799	50 20 54	3744
Alnath E.	42 14 38	3242	40 49 18	3231	39 23 45	3219	37 57 58	3209
Antares W.	101 10 19	2817	102 44 25	2804	104 18 48	2792	105 53 26	2780
Alnilam W.	56 49 42	3513	58 9 52	3473	59 30 46	3436	60 52 22	3402
Alnath E.	30 45 48	3155	29 18 45	3145	27 51 30	3138	26 24 6	3130
Antares W.	32 2 14	2695	33 39 1	2686	35 16 0	2677	36 53 11	2669
Alnilam E.	48 8 49	2524	46 28 9	2520	44 47 24	2517	43 6 34	2514
Alnath E.	55 56 40	2420	54 13 34	2418	52 30 25	2417	50 47 15	2417
Alnilam E.	91 26 38	2335	89 41 29	2331	87 56 13	2325	86 10 50	2321
Alnath E.	107 46 29	2312	106 0 47	2308	104 14 59	2302	102 29 3	2298
Antares W.	45 1 27	2640	46 39 28	2635	48 17 36	2631	49 55 49	2627
Alnilam E.	34 41 47	2511	33 0 49	2513	31 19 54	2516	29 39 3	2520
Alnath E.	42 11 52	2433	40 29 4	2439	38 46 25	2448	37 3 58	2458
Alnilam E.	77 22 20	2301	75 36 22	2298	73 50 20	2295	72 4 13	2293



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>b</sup> .	P. L. of diff.	VI <sup>b</sup> .	P. L. of diff.	IX <sup>b</sup> .	
15	Jupiter E.	100 43 0	2294	98 56 51	2289	97 10 36	2286	95 24 16	
16	SUN W.	51 34 8	2624	53 12 31	2621	54 50 58	2618	56 29 29	
	Aldebaran W.	9 52 5	2298	11 38 8	2294	13 24 17	2291	15 10 29	
	Mars E.	27 58 18	2527	26 17 42	2534	24 37 16	2545	22 57 6	
	Pollux E.	35 21 45	2471	33 39 51	2487	31 58 19	2505	30 17 13	
	Regulus E.	70 18 3	2291	68 31 50	2289	66 45 34	2286	64 59 14	
	Jupiter E.	86 31 27	2269	84 41 42	2268	82 57 55	2266	81 11 1	
17	SUN W.	64 42 45	2608	66 21 29	2607	68 0 14	2607	69 39 6	
	Aldebaran W.	24 2 15	2282	25 48 41	2282	27 35 7	2281	29 21 34	
	Pollux E.	22 2 24	2752	20 26 53	2837	18 53 13	2947	17 21 54	
	Regulus E.	56 7 12	2281	54 20 44	2281	52 34 16	2281	50 47 48	
	Jupiter E.	72 16 30	2260	70 29 32	2260	68 42 34	2260	66 55 36	
	Spica $\pi$ E.	109 47 37	2311	108 1 54	2311	106 16 11	2310	104 30 26	
18	SUN W.	77 52 49	2608	79 31 33	2609	81 10 16	2610	82 48 57	
	Aldebaran W.	38 13 44	2283	40 0 8	2285	41 46 30	2285	43 32 51	
	Regulus E.	41 55 31	2283	40 9 7	2284	38 22 44	2285	36 36 23	
	Jupiter E.	58 0 53	2264	56 14 0	2265	54 27 9	2266	52 40 19	
	Spica $\pi$ E.	95 41 39	2311	93 55 55	2312	92 10 13	2313	90 24 34	
19	SUN W.	91 1 51	2621	92 40 18	2623	94 18 42	2625	95 57 3	
	Aldebaran W.	52 24 2	2295	54 10 9	2297	55 56 13	2299	57 42 14	
	Mars W.	14 18 30	2702	15 55 7	2658	17 32 44	2626	19 11 4	
	Pollux W.	12 19 54	3948	13 34 7	3494	14 54 38	3246	16 19 53	
	Regulus E.	27 45 8	2295	25 59 1	2296	24 12 56	2299	22 26 53	
	Jupiter E.	43 46 45	2276	42 0 10	2278	40 13 39	2280	38 27 10	
	Spica $\pi$ E.	81 36 41	2323	79 51 15	2326	78 5 53	2328	76 20 34	
20	SUN W.	104 7 51	2643	105 45 48	2646	107 23 40	2649	109 1 28	
	Aldebaran W.	66 31 25	2315	68 17 3	2318	70 2 37	2321	71 48 6	
	Mars W.	27 28 43	2546	29 8 52	2543	30 49 6	2539	32 29 25	
	Pollux W.	24 6 4	2652	25 43 48	2615	27 22 23	2584	29 1 40	
	Jupiter E.	29 35 46	2297	27 49 42	2300	26 3 42	2304	24 17 48	
	Spica $\pi$ E.	67 35 5	2347	65 50 14	2351	64 5 29	2355	62 20 49	
21	SUN W.	117 9 1	2675	118 46 14	2681	120 23 20	2686	122 0 19	
	Aldebaran W.	80 34 19	2342	82 19 18	2346	84 4 10	2351	85 48 56	
	Mars W.	40 51 12	2540	42 31 30	2541	44 11 46	2544	45 51 58	
	Pollux W.	37 24 39	2491	39 6 5	2485	40 47 40	2480	42 29 22	
	Spica $\pi$ E.	53 39 14	2386	51 55 19	2391	50 11 32	2398	48 27 55	
	Antares E.	99 32 6	2402	97 48 34	2405	96 5 7	2409	94 21 45	
22	SUN W.	130 3 17	2723	131 39 27	2729	133 15 28	2737	134 51 19	
	Aldebaran W.	94 31 10	2378	96 15 16	2384	97 59 14	2389	99 43 4	
	Mars W.	54 11 52	2566	55 51 34	2569	57 31 11	2575	59 10 40	
	Pollux W.	50 58 49	2470	52 40 45	2471	54 22 39	2472	56 4 31	
	Regulus W.	14 22 13	2379	16 6 18	2384	17 50 16	2389	19 34 7	
	Spica $\pi$ E.	39 52 32	2449	38 10 7	2460	36 27 57	2471	34 46 3	
	Antares E.	85 46 32	2438	84 3 51	2443	82 21 18	2449	80 38 53	
23	Mars W.	67 26 14	2610	69 4 56	2616	70 43 29	2623	72 21 53	
	Pollux W.	64 32 47	2494	66 14 9	2499	67 55 24	2504	69 36 32	



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
15	Jupiter E.	93 37 51	2279	91 51 21	2276	90 4 47	2273	88 18 8	2271
16	SUN W.	58 8 4	2613	59 46 41	2612	61 25 20	2610	63 4 2	2609
	Aldebaran W.	16 56 46	2287	18 43 5	2285	20 29 27	2284	22 15 50	2283
	Mars E.	21 17 13	2577	19 37 46	2599	17 58 50	2632	16 20 38	2674
	Pollux E.	28 36 39	2556	26 56 44	2590	25 17 35	2633	23 39 25	2684
	Regulus E.	63 12 53	2284	61 26 30	2283	59 40 5	2282	57 53 39	2281
	Jupiter E.	79 24 13	2263	77 37 19	2262	75 50 23	2262	74 3 27	2261
17	SUN W.	71 17 46	2606	72 56 33	2607	74 35 19	2607	76 14 5	2608
	Aldebaran W.	31 8 1	2281	32 54 28	2282	34 40 54	2282	36 27 20	2283
	Pollux E.	15 53 39	2294	14 29 21	2375	13 10 19	2377	11 58 17	2375
	Regulus E.	49 1 19	2281	47 14 52	2281	45 28 24	2281	43 41 57	2282
	Jupiter E.	65 8 38	2260	63 21 40	2262	61 34 44	2262	59 47 48	2262
	Spica $\pi$ E.	102 44 40	2310	100 58 55	2309	99 13 9	2310	97 27 24	2310
18	SUN W.	84 27 36	2613	86 6 13	2615	87 44 48	2616	89 23 21	2618
	Aldebaran W.	45 19 9	2288	47 5 26	2289	48 51 41	2291	50 37 53	2293
	Regulus E.	34 50 3	2288	33 3 46	2289	31 17 31	2291	29 31 18	2293
	Jupiter E.	50 53 31	2269	49 6 46	2270	47 20 3	2272	45 33 22	2275
	Spica $\pi$ E.	88 38 53	2315	86 53 16	2318	85 7 42	2319	83 22 10	2321
19	SUN W.	97 35 20	2630	99 13 34	2633	100 51 44	2636	102 29 50	2640
	Aldebaran W.	59 28 11	2304	61 14 5	2306	62 59 56	2309	64 45 42	2311
	Mars W.	20 49 58	2583	22 29 16	2570	24 8 52	2560	25 48 42	2552
	Pollux W.	17 48 43	2934	19 20 19	2836	20 54 0	2758	22 29 23	2699
	Regulus E.	20 40 57	2304	18 55 3	2306	17 9 12	2309	15 23 26	2311
	Jupiter E.	36 40 46	2285	34 54 25	2288	33 8 8	2291	31 21 55	2294
	Spica $\pi$ E.	74 35 19	2334	72 50 9	2337	71 5 3	2340	69 20 1	2344
20	SUN W.	110 39 10	2658	112 16 46	2662	113 54 17	2666	115 31 42	2671
	Aldebaran W.	73 33 31	2327	75 18 51	2330	77 4 6	2335	78 49 15	2338
	Mars W.	34 9 46	2537	35 50 8	2537	37 30 30	2537	39 10 52	2538
	Pollux W.	30 41 30	2540	32 21 48	2524	34 2 28	2511	35 43 26	2500
	Jupiter E.	22 31 58	2311	20 46 14	2314	19 0 35	2318	17 15 2	2322
	Spica $\pi$ E.	60 36 16	2364	58 51 50	2369	57 7 30	2374	55 23 18	2380
21	SUN W.	123 37 10	2697	125 13 54	2702	126 50 31	2710	128 26 58	2716
	Aldebaran W.	87 33 37	2359	89 18 10	2364	91 2 37	2369	92 46 57	2373
	Mars W.	47 32 6	2550	49 12 10	2553	50 52 9	2557	52 32 3	2561
	Pollux W.	44 11 10	2472	45 53 2	2470	47 34 57	2470	49 16 53	2470
	Spica $\pi$ E.	46 44 27	2413	45 1 11	2420	43 18 5	2429	41 35 12	2438
	Antares E.	92 38 30	2417	90 55 20	2422	89 12 17	2427	87 29 21	2432
22	SUN W.	136 26 59	2753	138 2 29	2762	139 37 47	2771	141 12 53	2780
	Aldebaran W.	101 26 45	2401	103 10 19	2407	104 53 44	2413	106 37 0	2419
	Mars W.	60 50 2	2585	62 29 17	2591	64 8 25	2597	65 47 24	2604
	Pollux W.	57 46 19	2477	59 28 4	2482	61 9 43	2485	62 51 18	2489
	Regulus W.	21 17 49	2401	23 1 23	2407	24 44 48	2413	26 28 4	2419
	Spica $\pi$ E.	33 4 28	2499	31 23 14	2515	29 42 21	2534	28 1 55	2554
	Antares E.	78 56 37	2462	77 14 30	2469	75 32 33	2476	73 50 46	2483
23	Mars W.	74 0 7	2637	75 38 11	2645	77 16 5	2653	78 53 48	2661
	Pollux W.	71 17 32	2516	72 58 23	2522	74 39 6	2529	76 19 39	2536



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
		° ' "		° ' "		° ' "		° ' "
23	Regulus W.	28 11 11	2426	29 54 9	2432	31 36 58	2440	33 19 30
	Jupiter W.	12 23 43	2413	14 6 59	2419	15 50 7	2426	17 33 5
	Spica $\eta$ E.	26 21 57	2578	24 42 32	2606	23 3 45	2639	21 25 43
	Antares E.	72 9 9	2492	70 27 44	2499	68 46 29	2508	67 5 27
	$\alpha$ Aquilæ E.	117 23 36	3093	115 55 18	3080	114 26 44	3069	112 57 57
24	Mars W.	80 31 20	2669	82 8 41	2677	83 45 51	2687	85 22 48
	Pollux W.	78 0 2	2543	79 40 15	2551	81 20 17	2559	83 0 9
	Regulus W.	41 50 11	2485	43 31 45	2494	45 13 7	2502	46 54 17
	Jupiter W.	26 5 20	2471	27 47 14	2479	29 28 57	2488	31 10 27
	Antares E.	58 43 31	2567	57 3 51	2579	55 24 27	2591	53 45 19
	$\alpha$ Aquilæ E.	105 32 6	3043	104 2 46	3042	102 33 25	3043	101 4 6
25	Mars W.	93 24 33	2744	95 0 14	2753	96 35 43	2764	98 10 58
	Pollux W.	91 16 28	2613	92 55 6	2623	94 33 30	2632	96 11 41
	Regulus W.	55 17 2	2557	56 56 56	2567	58 36 37	2577	60 16 4
	Jupiter W.	39 34 51	2543	41 15 4	2553	42 55 4	2563	44 34 50
	Antares E.	45 34 14	2676	43 57 2	2693	42 20 13	2712	40 43 49
	$\alpha$ Aquilæ E.	93 38 46	3075	92 10 6	3083	90 41 36	3093	89 13 18
26	Mars W.	106 3 40	2830	107 37 29	2842	109 11 3	2853	110 44 22
	Regulus W.	68 29 47	2639	70 7 49	2650	71 45 36	2661	73 23 8
	Jupiter W.	52 50 8	2626	54 28 28	2637	56 6 33	2648	57 44 23
	Spica $\eta$ W.	16 0 11	2997	17 30 28	2948	19 1 46	2913	20 33 48
	Antares E.	32 48 50	2854	31 15 32	2885	29 42 54	2920	28 11 1
	$\alpha$ Aquilæ E.	81 55 22	3171	80 28 38	3186	79 2 12	3203	77 36 7
27	Regulus W.	81 27 5	2729	83 3 7	2739	84 38 55	2751	86 14 27
	Jupiter W.	65 49 47	2715	67 26 7	2727	69 2 11	2739	70 37 59
	Spica $\eta$ W.	28 19 8	2847	29 52 35	2848	31 26 1	2849	32 59 25
	$\alpha$ Aquilæ E.	70 31 22	3326	69 7 41	3351	67 44 28	3376	66 21 44
	Fomalhaut E.	103 29 26	3014	101 59 31	3023	100 29 47	3031	99 0 12
28	Regulus W.	94 8 24	2819	95 42 27	2830	97 16 16	2841	98 49 51
	Jupiter W.	78 33 18	2807	80 7 37	2818	81 41 41	2829	83 15 31
	Spica $\eta$ W.	40 44 54	2882	42 17 36	2890	43 50 8	2898	45 22 30
	$\alpha$ Aquilæ E.	59 36 15	3560	58 16 57	3598	56 58 20	3636	55 40 25
	Fomalhaut E.	91 35 15	3091	90 6 54	3101	88 38 45	3113	87 10 51
	$\alpha$ Pegasi E.	106 31 29	3174	105 4 49	3180	103 38 16	3186	102 11 50
29	Jupiter W.	91 1 12	2893	92 33 40	2903	94 5 55	2913	95 37 57
	Spica $\eta$ W.	33 1 45	2947	34 33 4	2955	36 4 13	2964	37 35 11
	$\alpha$ Aquilæ E.	49 22 40	3927	48 9 48	3988	46 57 57	4053	45 47 10
	Fomalhaut E.	79 54 51	3186	78 28 28	3198	77 2 17	3212	75 36 22
	$\alpha$ Pegasi E.	95 1 57	3233	93 36 27	3242	92 11 8	3252	90 46 0
	Saturn E.	120 2 1	2949	118 30 44	2960	116 59 41	2969	115 28 49
30	Jupiter W.	103 15 10	2967	104 46 4	2976	106 16 47	2983	107 47 21
	Spica $\eta$ W.	65 7 29	3011	66 37 28	3018	68 7 18	3026	69 36 59
	Antares W.	20 48 4	3454	22 9 20	3403	23 31 33	3364	24 54 31
	Fomalhaut E.	68 30 50	3297	67 6 35	3311	65 42 36	3327	64 18 56
	$\alpha$ Pegasi E.	83 43 9	3311	82 19 10	3321	80 55 23	3331	79 31 48
	Saturn E.	107 57 25	3022	106 27 40	3031	104 58 6	3039	103 28 41
	SUN E.	132 58 51	3372	131 36 2	3379	130 13 22	3386	128 50 49

MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Star's Name and Position.		Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
			° ' "		° ' "		° ' "		° ' "	
23	Regulus	W.	35 2 4	2454	36 44 22	2461	38 26 30	2470	40 8 26	2477
	Jupiter	W.	19 15 53	2440	20 58 31	2448	22 40 58	2455	24 23 15	2463
	Spica $\pi$	E.	19 48 35	2728	18 12 33	2791	16 37 53	2871	15 4 57	2978
	Antares	E.	65 24 37	2526	63 44 0	2535	62 3 36	2545	60 23 26	2556
	$\alpha$ Aquilæ	E.	111 29 0	3055	109 59 55	3049	108 30 43	3045	107 1 26	3043
24	Mars	W.	86 59 34	2705	88 36 8	2714	90 12 29	2724	91 48 37	2733
	Pollux	W.	84 39 49	2576	86 19 17	2585	87 58 33	2593	89 37 37	2603
	Regulus	W.	48 35 16	2520	50 16 1	2529	51 56 34	2538	53 36 55	2548
	Jupiter	W.	32 51 45	2505	34 32 51	2514	36 13 44	2524	37 54 24	2533
	Antares	E.	52 6 28	2616	50 27 55	2631	48 49 42	2645	47 11 48	2660
	$\alpha$ Aquilæ	E.	99 34 50	3050	98 5 39	3055	96 36 34	3061	95 7 36	3067
25	Mars	W.	99 45 59	2785	101 20 46	2796	102 55 19	2808	104 29 37	2819
	Pollux	W.	97 49 37	2654	99 27 19	2664	101 4 47	2676	102 41 59	2687
	Regulus	W.	61 55 17	2597	63 34 16	2607	65 13 1	2618	66 51 31	2629
	Jupiter	W.	46 14 22	2583	47 53 40	2593	49 32 44	2604	51 11 33	2615
	Antares	E.	39 7 50	2751	37 32 18	2774	35 57 16	2798	34 22 46	2825
	$\alpha$ Aquilæ	E.	87 45 13	3115	86 17 21	3128	84 49 45	3141	83 22 25	3155
26	Mars	W.	112 17 26	2877	113 50 14	2889	115 22 47	2901	116 55 5	2913
	Regulus	W.	75 0 26	2693	76 37 28	2694	78 14 16	2706	79 50 48	2717
	Jupiter	W.	59 21 58	2670	60 59 18	2681	62 36 23	2692	64 13 13	2704
	Spica $\pi$	W.	22 6 21	2872	23 39 16	2861	25 12 25	2853	26 45 44	2849
	Antares	E.	26 39 59	3006	25 9 54	3058	23 40 53	3120	22 13 8	3193
	$\alpha$ Aquilæ	E.	76 10 23	3240	74 45 1	3260	73 20 3	3281	71 55 29	3304
27	Regulus	W.	87 49 44	2774	89 24 46	2785	90 59 33	2796	92 34 6	2808
	Jupiter	W.	72 13 33	2761	73 48 52	2773	75 23 55	2784	76 58 44	2795
	Spica $\pi$	W.	34 32 44	2857	36 5 58	2863	37 39 4	2869	39 12 3	2875
	$\alpha$ Aquilæ	E.	64 59 31	3431	63 37 50	3461	62 16 43	3492	60 56 10	3526
	Fomalhaut	E.	97 30 49	3050	96 1 38	3059	94 32 38	3069	93 3 50	3079
28	Regulus	W.	100 23 11	2863	101 56 18	2873	103 29 11	2884	105 1 50	2894
	Jupiter	W.	84 49 7	2851	86 22 29	2862	87 55 37	2873	89 28 31	2883
	Spica $\pi$	W.	46 54 42	2913	48 26 44	2922	49 58 35	2931	51 30 15	2939
	$\alpha$ Aquilæ	E.	54 23 14	3721	53 6 49	3763	51 51 14	3818	50 36 30	3870
	Fomalhaut	E.	85 43 10	3136	84 15 44	3148	82 48 32	3161	81 21 36	3173
	$\alpha$ Pegasi	E.	100 45 33	3201	99 19 25	3209	97 53 26	3216	96 27 36	3225
29	Jupiter	W.	97 9 47	2932	98 41 25	2942	100 12 51	2950	101 44 6	2959
	Spica $\pi$	W.	59 5 59	2981	60 36 36	2988	62 7 4	2997	63 37 21	3004
	$\alpha$ Aquilæ	E.	44 37 32	4201	43 29 7	4283	42 21 59	4374	41 16 14	4472
	Fomalhaut	E.	74 10 43	3239	72 45 20	3253	71 20 13	3267	69 55 23	3282
	$\alpha$ Pegasi	E.	89 21 3	3270	87 56 17	3281	86 31 43	3290	85 7 20	3301
	Saturn	E.	113 58 9	2989	112 27 42	2997	110 57 25	3006	109 27 20	3014
30	Jupiter	W.	109 17 45	2998	110 48 1	3005	112 18 8	3012	113 48 6	3018
	Spica $\pi$	W.	71 6 32	3039	72 35 56	3044	74 5 14	3051	75 34 23	3056
	Antares	W.	26 18 5	3306	27 42 10	3283	29 6 41	3265	30 31 33	3252
	Fomalhaut	E.	62 55 35	3359	61 32 31	3377	60 9 48	3393	58 47 23	3412
	$\alpha$ Pegasi	E.	78 8 26	3353	76 45 16	3365	75 22 19	3376	73 59 35	3386
	Saturn	E.	101 59 25	3053	100 30 18	3060	99 1 19	3066	97 32 28	3072
	SUN	E.	127 28 25	3400	126 6 9	3406	124 43 59	3413	123 21 57	3418



## CONFIGURATIONS OF THE SATELLITES OF JUPITER

At 10<sup>h</sup> 30<sup>m</sup>, MEAN TIME.





Day of the Month.	West.		East.	
1			○ 2 3	
2		1	○ 4 3 2	
3		2 3 4	○ 1	
4		3 4	○	
5		4 3	○ 1 2	
6	4		○ 1 3 2	
7	4	2	○ 1 3	
8	1 ● 4		○	3
9		4 1	○	2 3
10		4 2 3	○ 1	
11		3 2 1	○	
12		3	○ 1 2 4	
13		1 3	○ 2 4	
14		2	○ 1 3 4	
15	1 ● 2 ●		○	3 4
16		1	○ 2 3 4	
17		2 3	○ 1 4	
18		3 2 1	○ 4	
19		3	○ 1 2	
20		4 3 1	○ 2	
21		4 2	○ 1 3	
22		4	○ 2 3	
23	4		○ 2 3	
24	4		○ 1	
25	4	3 2 1	○	
26		3 4	○ 2 1	
27		3 1 4	○ 2	
28		2	○ 1 3 4	
29		2 1	○ 3	
30			○ 1 2 3 4	

This Table represents, at 10<sup>h</sup> 30<sup>m</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the diagrams. The numerals 1, 2, 3, and 4, annexed to the points, serve to designate the Satellites from each other; and their positions are such as to indicate the directions of their motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite is placed by the side of the disc of Jupiter, and a black circle (●) that it is either *behind* the disc, or in the *shade* of Jupiter.

X.

APRIL, 1850.

ECLIPSES OF THE SATELLITES OF JUPITER.

TELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope
I.		h m s	h m s	
	1*	9 29 37.7	10 9 8.5	Em.
	3	3 58 10.1	4 44 39.5	Em.
	4	22 26 42.7	23 20 10.9	Em.
	6	16 55 14.6	17 55 41.4	Em.
	8*	11 23 46.7	12 31 12.1	Em.
	10	5 52 20.4	7 6 44.5	Em.
	12	0 20 54.8	1 42 17.6	Em.
	13	18 49 28.0	20 17 49.4	Em.
	15*	13 18 1.9	14 53 21.9	Em.
	17†	7 46 36.8	9 28 55.5	Em.
	19	2 15 13.1	4 4 30.5	Em.
	20	20 43 47.5	22 40 3.6	Em.
	22†	15 12 22.8	17 15 37.5	Em.
	24*	9 40 58.9	11 51 12.3	Em.
	26	4 9 36.5	6 26 48.5	Em.
	27	22 38 12.2	1 2 22.9	Em.
	29	17 6 48.6	19 37 58.0	Em.
				
II.	1*	9 22 2.5	10 1 32.1	Em.
	4	22 41 4.2	23 34 34.7	Em.
	8*	11 58 59.9	13 6 31.1	Em.
	12	1 18 3.9	2 39 36.0	Em.
	15*	14 36 2.2	16 11 35.1	Em.
	19	3 55 7.9	5 44 41.7	Em.
	22	17 13 8.9	19 16 43.4	Em.
	26	6 32 15.7	8 49 51.2	Em.
	29	19 50 17.5	22 21 53.7	Em.
				
III.	6	17 53 15.9	18 53 52.2	Em.
	13	21 51 22.2	23 20 13.5	Em.
	20	22 40 2.7	0 36 37.9	Im.
	21	1 49 35.6	3 46 41.9	Em.
	28	2 38 41.7	5 3 31.9	Im.
	28	5 47 30.4	8 12 51.6	Em.
				
IV.	11*	10 12 57.3	11 32 0.8	Im.
	11*	13 30 4.1	14 49 40.0	Em.
	28	4 15 29.6	6 40 35.7	Im.
	28†	7 24 34.6	9 50 11.8	Em.
				



APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.			TRANSITS OF SATELLITES.			TRANSITS OF SHADOWS.		
	Immersion.	Emersion.		Ingress.	Egress.		Ingress.	Egress.	
	d h m	d h m		d h m	d h m		d h m	d h	
I.	1† 7 21			2 4 37	2 6 55		2 5 11	2† 7	
	3 1 54			3 23 10	4 1 28		3 23 47	4 2	
	4 20 27			5† 17 44	5 20 2		5 18 23	5 20	
	6* 15 0			7* 12 17	7* 14 35		7* 12 58	7* 15	
	8* 9 34	In		9 6 51	9* 9 9		9 7 34	9* 9	
	10 4 7			11 1 24	11 3 42		11 2 10	11 4	
	11 22 41			12 19 58	12 22 16		12 20 46	12 23	
	13† 17 14			14* 14 32	14* 16 50		14* 15 21	14† 17	
	15* 11 48	the		16† 9 6	16* 11 24		16* 9 57	16* 12	
	17 6 22			18 3 40	18 5 58		18 4 33	18 6	
	18 0 56			19 22 14	19 0 32		19 23 8	19 1	
	20 19 29			21* 16 48	21 19 6		21† 17 44	21 20	
	22* 14 3	Shadow.		23* 11 22	23* 13 40		23* 12 20	23* 14	
	24 8 37			25 5 56	25 8 14		25 6 56	25 9	
	26 3 11			26 0 31	27 2 49		26 1 32	27 3	
	27 21 46			28 19 5	28 21 23		28 20 7	28 22	
	29* 16 20			30* 13 39	30* 15 58		30* 14 43	30† 17	
II.	1 6 6			3 0 48	3 3 36		3 2 0	3 4	
	4 19 30			6* 14 10	6† 16 58		6* 15 31	6 18	
	8* 8 53	In		10 3 32	10 6 21		10 5 2	10 7	
	11 22 18			13† 16 55	13 19 44		13 18 33	13 21	
	15* 11 42	the		17 6 18	17† 9 7		17 8 4	17* 10	
	18 1 7			20 19 42	20 22 32		20 21 35	20 0	
	22* 14 32	Shadow.		24 9 6	24* 11 56		24* 11 6	24* 13	
	26 3 59			27 22 32	27 1 21		27 0 38	28 3	
	29† 17 26								
III.	6* 12 56	In the		2 22 52	3 2 12		3 1 14	3 4	
	13* 16 49	Shadow.		10 2 44	10 6 5		10 5 41	10* 9	
	20 20 46	20 0 9		17 6 39	17* 10 2		17* 10 9	17* 13	
	27 0 47	28 4 11		24* 10 39	24* 14 2		24* 14 37	24 17	
IV.	11 4 17	11 7 48		2 18 39	2 22 3		2 0 2	3 3	
	27 20 44	27 0 26		19* 10 42	19* 14 19		19 19 10	19 22	

Day of the Month.	For correcting the Places of the Fixed Stars. At Mean Midnight, Logarithm of				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0-629573.	From Mean Noon of January 1.	
	A	B	C	D			Day of the Year.	Fraction of the Year.
						Days.		
1	-1.2632	-0.6243	+8.2829	+0.8292	23 18 13.08	9	90	.246
2	1.2615	0.6583	8.3199	0.8293	23 14 17.18	10	91	.249
3	1.2598	0.6897	8.3543	0.8295	23 10 21.27	11	92	.252
4	-1.2579	-0.7188	+8.3865	+0.8297	23 6 25.36	12	93	.255
5	1.2558	0.7460	8.4168	0.8300	23 2 29.46	13	94	.257
6	1.2536	0.7714	8.4453	0.8303	22 58 33.55	14	95	.260
7	-1.2513	-0.7953	+8.4720	+0.8306	22 54 37.65	15	96	.263
8	1.2488	0.8179	8.4976	0.8310	22 50 41.74	16	97	.266
9	1.2462	0.8391	8.5221	0.8314	22 46 45.83	17	98	.268
10	-1.2435	-0.8593	+8.5456	+0.8318	22 42 49.93	18	99	.271
11	1.2406	0.8784	8.5680	0.8322	22 38 54.02	19	100	.274
12	1.2376	0.8966	8.5895	0.8327	22 34 58.11	20	101	.277
13	-1.2344	-0.9139	+8.6102	+0.8332	22 31 2.21	21	102	.279
14	1.2311	0.9305	8.6303	0.8337	22 27 6.30	22	103	.282
15	1.2276	0.9463	8.6497	0.8343	22 23 10.39	23	104	.285
16	-1.2240	-0.9614	+8.6684	+0.8349	22 19 14.48	24	105	.287
17	1.2202	0.9758	8.6866	0.8355	22 15 18.58	25	106	.290
18	1.2162	0.9897	8.7043	0.8361	22 11 22.67	26	107	.293
19	-1.2121	-1.0030	+8.7215	+0.8367	22 7 26.76	27	108	.296
20	1.2078	1.0158	8.7382	0.8374	22 3 30.85	28	109	.298
21	1.2034	1.0281	8.7545	0.8381	21 59 34.95	29	110	.301
22	-1.1988	-1.0399	+8.7704	+0.8388	21 55 39.04	30	111	.304
23	1.1940	1.0513	8.7860	0.8395	21 51 43.13	31	112	.307
24	1.1891	1.0622	8.8011	0.8402	21 47 47.22	32	113	.309
25	-1.1839	-1.0728	+8.8159	+0.8409	21 43 51.32	33	114	.312
26	1.1786	1.0830	8.8305	0.8417	21 39 55.41	34	115	.315
27	1.1731	1.0928	8.8447	0.8424	21 35 59.50	35	116	.318
28	-1.1674	-1.1023	+8.8587	+0.8432	21 32 3.59	36	117	.320
29	1.1615	1.1114	8.8724	0.8440	21 28 7.69	37	118	.323
30	1.1554	1.1203	8.8858	0.8447	21 24 11.78	38	119	.326
31	-1.1490	-1.1288	+8.8990	+0.8455	21 20 15.87	39	120	.329



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be subtracted from Apparent Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.		
		h m s	s	° ' "	"	m s	m s
Wed.	1	2 33 10.42	9.544	N.15 3 2.4	45.10	1 5.97	3 2.89
Thur.	2	2 36 59.48	9.568	15 21 4.8	44.47	1 6.05	3 10.36
Frid.	3	2 40 49.12	9.592	15 38 52.1	43.83	1 6.13	3 17.26
Sat.	4	2 44 39.34	9.616	15 56 24.0	43.17	1 6.21	3 23.58
Sun.	5	2 48 30.13	9.640	16 13 40.2	42.50	1 6.29	3 29.33
Mon.	6	2 52 21.49	9.665	16 30 40.3	41.82	1 6.37	3 34.51
Tues.	7	2 56 13.44	9.689	16 47 24.1	41.13	1 6.45	3 39.11
Wed.	8	3 0 5.97	9.713	17 3 51.3	40.43	1 6.53	3 43.12
Thur.	9	3 3 59.09	9.738	17 20 1.5	39.71	1 6.61	3 46.55
Frid.	10	3 7 52.79	9.762	17 35 54.5	38.98	1 6.69	3 49.39
Sat.	11	3 11 47.08	9.786	17 51 29.9	38.23	1 6.77	3 51.63
Sun.	12	3 15 41.94	9.810	18 6 47.4	37.47	1 6.85	3 53.34
Mon.	13	3 19 37.37	9.834	18 21 46.7	36.70	1 6.94	3 54.46
Tues.	14	3 23 33.38	9.857	18 36 27.5	35.92	1 7.02	3 55.01
Wed.	15	3 27 29.95	9.880	18 50 49.5	35.12	1 7.11	3 54.99
Thur.	16	3 31 27.08	9.902	19 4 52.5	34.31	1 7.19	3 54.42
Frid.	17	3 35 24.76	9.925	19 18 36.0	33.50	1 7.27	3 53.30
Sat.	18	3 39 22.97	9.948	19 31 59.9	32.67	1 7.35	3 51.64
Sun.	19	3 43 21.73	9.971	19 45 3.9	31.83	1 7.43	3 49.44
Mon.	20	3 47 21.03	9.993	19 57 47.7	30.97	1 7.51	3 46.71
Tues.	21	3 51 20.85	10.014	20 10 11.0	30.11	1 7.58	3 43.46
Wed.	22	3 55 21.19	10.036	20 22 13.7	29.24	1 7.66	3 39.68
Thur.	23	3 59 22.06	10.057	20 33 55.4	28.36	1 7.73	3 35.38
Frid.	24	4 3 23.41	10.078	20 45 16.0	27.47	1 7.81	3 30.57
Sat.	25	4 7 25.32	10.099	20 56 15.2	26.57	1 7.88	3 25.26
Sun.	26	4 11 27.70	10.120	21 6 52.8	25.66	1 7.95	3 19.45
Mon.	27	4 15 30.58	10.140	21 17 8.6	24.74	1 8.01	3 13.14
Tues.	28	4 19 33.91	10.160	21 27 2.4	23.82	1 8.08	3 6.36
Wed.	29	4 23 37.77	10.179	21 36 34.0	22.88	1 8.14	2 59.11
Thur.	30	4 27 42.06	10.198	21 45 43.2	21.94	1 8.20	2 51.39
Frid.	31	4 31 46.81	10.217	21 54 29.7	20.99	1 8.26	2 43.22
Sat.	32	4 35 52.01		22 2 24.5		1 8.32	2 34.60

\* Mean Time of the Semidiameter passing may be found by subtracting 0.18 from the Sidereal

## AT MEAN NOON.

	Day of the Month.	THE SUN'S			Equation of Time, to be added to Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
ed.	1	2 33 10·91	N.15 3 4·6	15 53·0	3 2·91	2 36 13·82
ur.	2	2 36 59·99	15 21 7·1	15 52·8	3 10·38	2 40 10·37
id.	3	2 40 49·65	15 38 54·5	15 52·6	3 17·28	2 44 6·93
t.	4	2 44 39·88	15 56 26·4	15 52·3	3 23·60	2 48 3·48
n.	5	2 48 30·69	16 13 42·6	15 52·1	3 29·35	2 52 0·03
on.	6	2 52 22·07	16 30 42·8	15 51·9	3 34·52	2 55 56·59
es.	7	2 56 14·03	16 47 26·6	15 51·6	3 39·12	2 59 53·14
ed.	8	3 0 6·57	17 3 53·8	15 51·4	3 43·13	3 3 49·70
ur.	9	3 3 59·70	17 20 4·0	15 51·2	3 46·55	3 7 46·25
id.	10	3 7 53·41	17 35 57·0	15 51·0	3 49·40	3 11 42·81
t.	11	3 11 47·71	17 51 32·4	15 50·8	3 51·66	3 15 39·36
n.	12	3 15 42·58	18 6 49·9	15 50·6	3 53·34	3 19 35·92
on.	13	3 19 38·01	18 21 49·1	15 50·4	3 54·46	3 23 32·47
es.	14	3 23 34·02	18 36 29·8	15 50·2	3 55·01	3 27 29·03
ed.	15	3 27 30·59	18 50 51·8	15 50·0	3 54·99	3 31 25·58
ur.	16	3 31 27·73	19 4 54·7	15 49·8	3 54·41	3 35 22·14
id.	17	3 35 25·40	19 18 38·2	15 49·6	3 53·29	3 39 18·69
t.	18	3 39 23·61	19 32 2·0	15 49·4	3 51·63	3 43 15·25
n.	19	3 43 22·37	19 45 5·9	15 49·2	3 49·44	3 47 11·81
on.	20	3 47 21·66	19 57 49·6	15 49·1	3 46·71	3 51 8·36
es.	21	3 51 21·47	20 10 12·9	15 48·9	3 43·45	3 55 4·92
ed.	22	3 55 21·81	20 22 15·5	15 48·7	3 39·67	3 59 1·47
ur.	23	3 59 22·66	20 33 57·1	15 48·6	3 35·37	4 2 58·03
id.	24	4 3 24·03	20 45 17·6	15 48·4	3 30·56	4 6 54·59
t.	25	4 7 25·90	20 56 16·8	15 48·2	3 25·25	4 10 51·14
n.	26	4 11 28·27	21 6 54·3	15 48·1	3 19·43	4 14 47·70
on.	27	4 15 31·13	21 17 10·0	15 47·9	3 13·13	4 18 44·25
es.	28	4 19 34·47	21 27 3·7	15 47·8	3 6·35	4 22 40·81
ed.	29	4 23 38·28	21 36 35·1	15 47·6	2 59·09	4 26 37·37
ur.	30	4 27 42·55	21 45 44·2	15 47·5	2 51·37	4 30 33·92
id.	31	4 31 47·28	21 54 30·7	15 47·3	2 43·20	4 34 30·48
t.	32	4 35 52·45	N.22 2 54·4	15 47·2	2 34·59	4 38 27·04

\* The Semidiameter for Apparent Noon may be assumed the same as that for Mean Noon.



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Pa	
	Noon.	Noon.		Noon.	Midnight.	Noon.	M
1	40° 43' 13" 8	N. 0° 51'	0.0035735	14 49' 2"	14 47' 5"	54 23' 0"	54
2	41 41 22 0	0 41	0.0036826	14 46 5	14 46 1	54 13 1	54
3	42 39 28 9	0 28	0.0037908	14 46 5	14 47 6	54 13 2	54
4	43 37 34 5	0 15	0.0038979	14 49 3	14 51 7	54 23 5	54
5	44 35 38 7	N. 0 01	0.0040038	14 54 9	14 58 7	54 43 9	54
6	45 33 41 5	S. 0 12	0.0041084	15 3 1	15 8 1	55 14 3	55
7	46 31 42 8	0 24	0.0042115	15 13 6	15 19 4	55 52 5	56
8	47 29 42 8	0 33	0.0043128	15 25 6	15 32 1	56 36 7	57
9	48 27 41 4	0 41	0.0044123	15 38 5	15 44 8	57 23 9	57
10	49 25 38 5	0 46	0.0045099	15 51 0	15 56 9	58 9 9	58
11	50 23 34 3	0 47	0.0046057	16 2 3	16 7 1	58 51 3	59
12	51 21 28 5	0 46	0.0046995	16 11 3	16 14 7	59 24 5	59
13	52 19 21 0	0 42	0.0047913	16 17 3	16 19 1	59 46 6	59
14	53 17 12 1	0 35	0.0048811	16 20 1	16 20 2	59 56 6	59
15	54 15 1 6	0 26	0.0049690	16 19 6	16 18 3	59 54 7	59
16	55 12 49 5	0 14	0.0050551	16 16 4	16 13 9	59 43 0	59
17	56 10 35 6	S. 0 02	0.0051394	16 11 0	16 7 8	59 23 3	59
18	57 8 20 0	N. 0 11	0.0052220	16 4 3	16 0 6	58 58 8	58
19	58 6 2 8	0 25	0.0053030	15 56 8	15 52 8	58 31 1	58
20	59 3 44 0	0 37	0.0053824	15 48 8	15 44 7	58 1 9	57
21	60 1 23 6	0 47	0.0054605	15 40 5	15 36 4	57 31 5	57
22	60 59 1 7	0 56	0.0055374	15 32 2	15 28 1	57 0 9	56
23	61 56 38 4	0 63	0.0056130	15 23 9	15 19 8	56 30 5	56
24	62 54 13 7	0 66	0.0056875	15 15 7	15 11 8	56 0 5	55
25	63 51 47 7	0 67	0.0057610	15 7 9	15 4 2	55 31 8	55
26	64 49 20 5	0 64	0.0058333	15 0 8	14 57 5	55 5 5	54
27	65 46 52 2	0 59	0.0059046	14 54 5	14 51 8	54 42 6	54
28	66 44 22 8	0 51	0.0059747	14 49 5	14 47 6	54 24 2	54
29	67 41 52 5	0 40	0.0060436	14 46 1	14 45 1	54 11 6	54
Thurs	68 39 21 2	0 28	0.0061112	14 44 6	14 44 6	54 6 1	54
Fri	69 36 49 2	0 15	0.0061773	14 45 3	14 46 6	54 8 7	54
32	70 34 16 5	N. 0 01	0.0062420	14 48 5	14 51 1	54 20 5	54

## MEAN TIME.

Day of the Month.		THE MOON'S							
		Longitude.		Latitude.		Age.	Meridian		
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.		
		° ' "	° ' "	° ' "	° ' "	d	h	m	
d.	1	278 39 35.1	284 36 48.7	N.3 19 27.7	N.2 54 45.5	19.0	16 32.7		
ur.	2	290 32 26.7	296 27 4.7	2 28 14.5	2 0 11.2	20.0	17 20.3		
d.	3	302 21 20.1	308 15 52.6	1 30 50.9	N.1 0 29.5	21.0	18 7.0		
.	4	314 11 22.7	320 8 31.8	N.0 29 23.7	S.0 2 10.0	22.0	18 52.9		
i.	5	326 8 1.5	332 10 32.0	S.0 33 54.1	1 5 30.6	23.0	19 38.2		
n.	6	338 16 42.7	344 27 10.6	1 36 40.2	2 7 2.1	24.0	20 23.5		
es.	7	350 42 29.1	357 3 7.2	2 36 14.8	3 3 54.4	25.0	21 9.2		
d.	8	3 29 28.9	10 1 51.3	3 29 37.4	3 52 58.2	26.0	21 56.2		
ur.	9	16 40 23.8	23 25 7.5	4 13 31.1	4 30 50.2	27.0	22 45.1		
d.	10	30 15 54.2	37 12 26.2	4 44 31.5	4 54 13.1	28.0	23 36.7		
.	11	44 14 17.1	51 20 51.3	4 59 35.7	5 0 24.4	29.0	24 6		
i.	12	58 31 24.9	65 45 10.8	4 56 30.1	4 47 49.7	0.5	0 31.2		
n.	13	73 1 15.9	80 18 46.4	4 34 27.1	4 16 33.2	1.5	1 28.7		
es.	14	87 36 49.4	94 54 35.4	3 54 24.4	3 28 25.1	2.5	2 28.4		
d.	15	102 11 19.6	109 26 23.5	2 59 3.5	2 26 52.4	3.5	3 28.8		
ur.	16	116 39 15.8	123 49 32.1	1 52 27.4	1 16 25.3	4.5	4 28.4		
d.	17	130 56 55.7	138 1 14.9	S.0 39 24.6	S.0 2 1.8	5.5	5 25.8		
.	18	145 2 24.6	152 0 22.4	N.0 35 7.1	N.1 11 27.0	6.5	6 20.5		
i.	19	158 55 10.0	165 46 50.4	1 46 26.6	2 19 37.2	7.5	7 12.4		
n.	20	172 35 27.8	179 21 5.9	2 50 31.8	3 18 47.0	8.5	8 2.0		
es.	21	186 3 48.1	192 43 37.3	3 44 2.9	4 6 2.8	9.5	8 50.1		
d.	22	199 20 34.5	205 54 39.4	4 24 33.0	4 39 23.2	10.5	9 37.4		
ur.	23	212 25 50.5	218 54 5.4	4 50 27.1	4 57 40.6	11.5	10 24.5		
d.	24	225 19 21.3	231 41 35.2	5 1 3.1	5 0 38.4	12.5	11 12.0		
.	25	238 0 45.3	244 16 49.8	4 56 31.3	4 48 49.7	13.5	12 0.1		
n.	26	250 29 49.6	256 39 47.8	4 37 44.5	4 23 27.5	14.5	12 48.7		
es.	27	262 46 49.7	268 51 4.5	4 6 13.7	3 46 17.4	15.5	13 37.6		
d.	28	274 52 44.7	280 52 5.7	3 23 54.8	2 59 22.6	16.5	14 26.4		
ur.	29	286 49 27.1	292 45 11.5	2 32 58.4	2 4 59.2	17.5	15 14.5		
n.	30	298 39 45.0	304 33 37.1	1 35 41.4	1 5 23.1	18.5	16 1.6		
d.	31	310 27 19.7	316 21 27.3	N.0 34 21.7	N.0 2 53.9	19.5	16 47.6		
.	32	322 16 36.8	328 13 26.5	S.0 28 42.8	S.1 0 10.5	20.5	17 32.6		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
WEDNESDAY 1.				FRIDAY 3.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	18 36 47.07	S. 19 51 22.7	0.27	0	20 17 4.48	S. 18 10 25.5
1	18 38 54.06	19 51 24.3	0.68	1	20 19 7.88	18 6 11.7
2	18 41 0.99	19 51 20.2	1.60	2	20 21 11.19	18 1 52.9
3	18 43 7.87	19 51 10.6	2.53	3	20 23 14.41	17 57 29.2
4	18 45 14.69	19 50 55.4	3.47	4	20 25 17.55	17 53 0.6
5	18 47 21.46	19 50 34.6	4.38	5	20 27 20.61	17 48 27.2
6	18 49 28.16	19 50 8.3	5.33	6	20 29 23.58	17 43 48.9
7	18 51 34.81	19 49 36.3	6.25	7	20 31 26.46	17 39 5.8
8	18 53 41.40	19 48 58.8	7.17	8	20 33 29.26	17 34 17.9
9	18 55 47.92	19 48 15.8	8.08	9	20 35 31.99	17 29 25.2
10	18 57 54.38	19 47 27.3	9.02	10	20 37 34.62	17 24 27.7
11	19 0 0.77	19 46 33.2	9.93	11	20 39 37.17	17 19 25.5
12	19 2 7.10	19 45 33.6	10.85	12	20 41 39.63	17 14 18.6
13	19 4 13.36	19 44 28.5	11.77	13	20 43 42.01	17 9 7.0
14	19 6 19.56	19 43 17.9	12.67	14	20 45 44.31	17 3 50.6
15	19 8 25.68	19 42 1.9	13.60	15	20 47 46.53	16 58 29.6
16	19 10 31.74	19 40 40.3	14.50	16	20 49 48.67	16 53 4.0
17	19 12 37.73	19 39 13.3	15.40	17	20 51 50.72	16 47 33.7
18	19 14 43.64	19 37 40.9	16.32	18	20 53 52.69	16 41 58.9
19	19 16 49.49	19 36 3.0	17.22	19	20 55 54.58	16 36 19.5
20	19 18 55.26	19 34 19.7	18.12	20	20 57 56.40	16 30 35.5
21	19 21 0.96	19 32 31.0	19.02	21	20 59 58.13	16 24 47.0
22	19 23 6.58	19 30 36.9	19.92	22	21 1 59.79	16 18 54.0
23	19 25 12.13	S. 19 28 37.4	20.80	23	21 4 1.37	S. 16 12 56.5
THURSDAY 2.				SATURDAY 4.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	19 27 17.60	S. 19 26 32.6	21.70	0	21 6 2.88	S. 16 6 54.5
1	19 29 22.99	19 24 22.4	22.60	1	21 8 4.31	16 0 48.1
2	19 31 28.30	19 22 6.8	23.48	2	21 10 5.66	15 54 37.3
3	19 33 33.54	19 19 45.9	24.37	3	21 12 6.94	15 48 22.1
4	19 35 38.70	19 17 19.7	25.25	4	21 14 8.15	15 42 2.5
5	19 37 43.78	19 14 48.2	26.12	5	21 16 9.29	15 35 38.6
6	19 39 48.77	19 12 11.5	27.02	6	21 18 10.35	15 29 10.4
7	19 41 53.69	19 9 29.4	27.88	7	21 20 11.35	15 22 37.9
8	19 43 58.52	19 6 42.1	28.75	8	21 22 12.28	15 16 1.1
9	19 46 3.28	19 3 49.6	29.62	9	21 24 13.14	15 9 20.0
10	19 48 7.95	19 0 51.9	30.50	10	21 26 13.93	15 2 34.7
11	19 50 12.54	18 57 48.9	31.35	11	21 28 14.66	14 55 45.3
12	19 52 17.04	18 54 40.8	32.22	12	21 30 15.32	14 48 51.6
13	19 54 21.46	18 51 27.5	33.07	13	21 32 15.92	14 41 53.8
14	19 56 25.80	18 48 9.1	33.93	14	21 34 16.46	14 34 51.8
15	19 58 30.05	18 44 45.5	34.78	15	21 36 16.94	14 27 45.8
16	20 0 34.22	18 41 16.8	35.63	16	21 38 17.35	14 20 35.7
17	20 2 38.30	18 37 43.0	36.47	17	21 40 17.71	14 13 21.5
18	20 4 42.30	18 34 4.2	37.32	18	21 42 18.02	14 6 3.3
19	20 6 46.21	18 30 20.3	38.17	19	21 44 18.27	13 58 41.1
20	20 8 50.03	18 26 31.3	39.00	20	21 46 18.46	13 51 14.9
21	20 10 53.77	18 22 37.3	39.82	21	21 48 18.60	13 43 44.8
22	20 12 57.43	18 18 38.4	40.67	22	21 50 18.69	13 36 10.8
23	20 15 1.00	18 14 34.4	41.48	23	21 52 18.74	13 28 32.8
24	20 17 4.48	S. 18 10 25.5		24	21 54 18.73	S. 13 20 51.0



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

ur.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 5.				TUESDAY 7.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	21 54 18.73	S. 13 20 51.0	77.60	0	23 29 58.75	S. 6 4 41.5	102.65
1	21 56 18.68	13 13 5.4	78.25	1	23 31 58.81	5 54 25.6	103.05
2	21 58 18.58	13 5 15.9	78.88	2	23 33 58.92	5 44 7.3	103.43
3	22 0 18.44	12 57 22.6	79.50	3	23 35 59.10	5 33 46.7	103.78
4	22 2 18.26	12 49 25.6	80.12	4	23 37 59.34	5 23 24.0	104.17
5	22 4 18.03	12 41 24.9	80.75	5	23 39 59.65	5 12 59.0	104.53
6	22 6 17.77	12 33 20.4	81.37	6	23 42 0.03	5 2 31.8	104.88
7	22 8 17.48	12 25 12.2	81.97	7	23 44 0.49	4 52 2.5	105.22
8	22 10 17.15	12 17 0.4	82.58	8	23 46 1.02	4 41 31.2	105.57
9	22 12 16.78	12 8 44.9	83.17	9	23 48 1.63	4 30 57.8	105.90
10	22 14 16.39	12 0 25.9	83.78	10	23 50 2.32	4 20 22.4	106.22
11	22 16 15.96	11 52 3.2	84.37	11	23 52 3.09	4 9 45.1	106.55
12	22 18 15.51	11 43 37.0	84.97	12	23 54 3.95	3 59 5.8	106.85
13	22 20 15.04	11 35 7.2	85.53	13	23 56 4.90	3 48 24.7	107.17
14	22 22 14.54	11 26 34.0	86.12	14	23 58 5.94	3 37 41.7	107.45
15	22 24 14.01	11 17 57.3	86.70	15	0 0 7.08	3 26 57.0	107.75
16	22 26 13.48	11 9 17.1	87.25	16	0 2 8.31	3 16 10.5	108.03
17	22 28 12.92	11 0 33.6	87.83	17	0 4 9.65	3 5 22.3	108.30
18	22 30 12.34	10 51 46.6	88.38	18	0 6 11.09	2 54 32.5	108.57
19	22 32 11.76	10 42 56.3	88.93	19	0 8 12.64	2 43 41.1	108.88
20	22 34 11.16	10 34 2.7	89.48	20	0 10 14.30	2 32 48.0	109.08
1	22 36 10.55	10 25 5.8	90.03	21	0 12 16.07	2 21 53.5	109.33
2	22 38 9.94	10 16 5.6	90.57	22	0 14 17.95	2 10 57.5	109.58
3	22 40 9.31	S. 10 7 2.2	91.10	23	0 16 19.95	S. 2 0 0.0	109.80
MONDAY 6.				WEDNESDAY 8.			
0	22 42 8.69	S. 9 57 55.6	91.63	0	0 18 22.07	S. 1 49 1.2	110.03
1	22 44 8.07	9 48 45.8	92.15	1	0 20 24.32	1 38 1.0	110.25
2	22 46 7.44	9 39 32.9	92.67	2	0 22 26.69	1 26 59.5	110.45
3	22 48 6.82	9 30 16.9	93.17	3	0 24 29.19	1 15 56.8	110.65
4	22 50 6.21	9 20 57.9	93.68	4	0 26 31.82	1 4 52.9	110.83
5	22 52 5.60	9 11 35.8	94.20	5	0 28 34.58	0 53 47.9	111.02
6	22 54 5.00	9 2 10.6	94.68	6	0 30 37.49	0 42 41.8	111.20
7	22 56 4.42	8 52 42.5	95.17	7	0 32 40.53	0 31 34.6	111.37
8	22 58 3.85	8 43 11.5	95.67	8	0 34 43.72	0 20 26.4	111.52
9	23 0 3.30	8 33 37.5	96.13	9	0 36 47.05	S. 0 9 17.3	111.67
10	23 2 2.77	8 24 0.7	96.62	10	0 38 50.54	N. 0 1 52.7	111.80
11	23 4 2.26	8 14 21.0	97.08	11	0 40 54.17	0 13 3.5	111.93
12	23 6 1.77	8 4 38.5	97.55	12	0 42 57.96	0 24 15.1	112.05
13	23 8 1.31	7 54 53.2	98.00	13	0 45 1.91	0 35 27.4	112.17
14	23 10 0.88	7 45 5.2	98.45	14	0 47 6.01	0 46 40.4	112.27
15	23 12 0.49	7 35 14.5	98.90	15	0 49 10.28	0 57 54.0	112.37
16	23 14 0.12	7 25 21.1	99.35	16	0 51 14.72	1 9 8.2	112.45
17	23 15 59.80	7 15 25.0	99.78	17	0 53 19.32	1 20 22.9	112.52
18	23 17 59.51	7 5 26.3	100.20	18	0 55 24.10	1 31 38.0	112.60
19	23 19 59.27	6 55 25.1	100.63	19	0 57 29.05	1 42 53.6	112.65
20	23 21 59.07	6 45 21.3	101.05	20	0 59 34.18	1 54 9.5	112.68
1	23 23 58.91	6 35 15.0	101.45	21	1 1 39.49	2 5 25.6	112.73
2	23 25 58.81	6 25 6.3	101.87	22	1 3 44.98	2 16 42.0	112.75
3	23 27 58.75	6 14 55.1	102.27	23	1 5 50.66	2 27 58.5	112.78
4	23 29 58.75	S. 6 4 41.5		24	1 7 56.52	N. 2 39 15.2	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
THURSDAY 9.				SATURDAY 11.		
0	1 7 56.52	N. 2 39 15.2	112.78	0	2 53 8.15	N. 11 21 0.2
1	1 10 2.58	2 50 31.9	112.78	1	2 55 26.10	11 30 58.3
2	1 12 8.83	3 1 48.6	112.77	2	2 57 44.34	11 40 52.9
3	1 14 15.27	3 13 5.2	112.75	3	3 0 2.87	11 50 43.9
4	1 16 21.91	3 24 21.7	112.72	4	3 2 21.69	12 0 31.2
5	1 18 28.76	3 35 38.0	112.67	5	3 4 40.80	12 10 14.8
6	1 20 35.81	3 46 54.0	112.62	6	3 7 0.19	12 19 54.6
7	1 22 43.07	3 58 9.7	112.55	7	3 9 19.87	12 29 30.4
8	1 24 50.54	4 9 25.0	112.48	8	3 11 39.85	12 39 2.2
9	1 26 58.22	4 20 39.9	112.38	9	3 14 0.11	12 48 30.0
10	1 29 6.12	4 31 54.2	112.30	10	3 16 20.66	12 57 53.6
11	1 31 14.23	4 43 8.0	112.18	11	3 18 41.50	13 7 13.0
12	1 33 22.57	4 54 21.1	112.07	12	3 21 2.63	13 16 28.0
13	1 35 31.13	5 5 33.5	111.93	13	3 23 24.05	13 25 38.6
14	1 37 39.91	5 16 45.1	111.80	14	3 25 45.75	13 34 44.8
15	1 39 48.92	5 27 55.9	111.63	15	3 28 7.75	13 43 46.3
16	1 41 58.16	5 39 5.7	111.48	16	3 30 30.03	13 52 43.3
17	1 44 7.64	5 50 14.6	111.30	17	3 32 52.60	14 1 35.4
18	1 46 17.35	6 1 22.4	111.10	18	3 35 15.45	14 10 22.8
19	1 48 27.29	6 12 29.0	110.92	19	3 37 38.59	14 19 5.3
20	1 50 37.48	6 23 34.5	110.70	20	3 40 2.02	14 27 42.8
21	1 52 47.91	6 34 38.7	110.47	21	3 42 25.73	14 36 15.3
22	1 54 58.58	6 45 41.5	110.23	22	3 44 49.72	14 44 42.6
23	1 57 9.50	N. 6 56 42.9	110.00	23	3 47 13.99	N. 14 53 4.7
FRIDAY 10.				SUNDAY 12.		
0	1 59 20.67	N. 7 7 42.9	109.73	0	3 49 38.55	N. 15 1 21.5
1	2 1 32.09	7 18 41.3	109.45	1	3 52 3.39	15 9 33.0
2	2 3 43.76	7 29 38.0	109.17	2	3 54 28.50	15 17 39.0
3	2 5 55.68	7 40 33.0	108.88	3	3 56 53.89	15 25 39.4
4	2 8 7.87	7 51 26.3	108.57	4	3 59 19.56	15 33 34.3
5	2 10 20.31	8 2 17.7	108.25	5	4 1 45.49	15 41 23.5
6	2 12 33.01	8 13 7.2	107.90	6	4 4 11.70	15 49 6.9
7	2 14 45.98	8 23 54.6	107.57	7	4 6 38.17	15 56 44.5
8	2 16 59.21	8 34 40.0	107.20	8	4 9 4.91	16 4 16.1
9	2 19 12.71	8 45 23.2	106.83	9	4 11 31.91	16 11 41.8
10	2 21 26.47	8 56 4.2	106.45	10	4 13 59.17	16 19 1.4
11	2 23 40.51	9 6 42.9	106.05	11	4 16 26.69	16 26 14.8
12	2 25 54.81	9 17 19.2	105.65	12	4 18 54.47	16 33 22.1
13	2 28 9.39	9 27 53.1	105.22	13	4 21 22.50	16 40 23.1
14	2 30 24.24	9 38 24.4	104.77	14	4 23 50.78	16 47 17.7
15	2 32 39.37	9 48 53.0	104.33	15	4 26 19.31	16 54 5.8
16	2 34 54.78	9 59 19.0	103.87	16	4 28 48.08	17 0 47.5
17	2 37 10.46	10 9 42.2	103.40	17	4 31 17.09	17 7 22.6
18	2 39 26.43	10 20 2.6	102.90	18	4 33 46.34	17 13 51.0
19	2 41 42.67	10 30 20.0	102.40	19	4 36 15.83	17 20 12.8
20	2 43 59.20	10 40 34.4	101.88	20	4 38 45.54	17 26 27.8
21	2 46 16.01	10 50 45.7	101.35	21	4 41 15.48	17 32 35.9
22	2 48 33.11	11 0 53.8	100.82	22	4 43 45.64	17 38 37.2
23	2 50 50.49	11 10 58.7	100.25	23	4 46 16.02	17 44 31.4
24	2 53 8.15	N. 11 21 0.2		24	4 48 46.62	N. 17 50 18.7



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

R.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 13.				WEDNESDAY 15.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
4	48 46 62	N. 17 50 18 7	56 70	0	6 51 50 43	N. 19 55 31 6	7 52
4	51 17 43	17 55 58 9	55 50	1	6 54 25 14	19 54 46 5	8 90
4	53 48 45	18 1 31 9	54 30	2	6 56 59 78	19 53 53 1	10 28
4	56 19 67	18 6 57 7	53 08	3	6 59 34 35	19 52 51 4	11 67
4	58 51 09	18 12 16 2	51 87	4	7 2 8 84	19 51 41 4	13 03
5	1 22 70	18 17 27 4	50 65	5	7 4 43 24	19 50 23 2	14 43
5	3 51 51	18 22 31 3	49 40	6	7 7 17 56	19 48 56 6	15 78
5	6 26 50	18 27 27 7	48 15	7	7 9 51 78	19 47 21 9	17 17
5	8 58 67	18 32 16 6	46 90	8	7 12 25 90	19 45 38 9	18 53
5	11 31 01	18 36 58 0	45 65	9	7 14 59 92	19 43 47 7	19 88
5	14 3 53	18 41 31 9	44 37	10	7 17 33 82	19 41 48 4	21 23
5	16 36 21	18 45 58 1	43 08	11	7 20 7 61	19 39 41 0	22 60
5	19 9 05	18 50 16 6	41 80	12	7 22 41 27	19 37 25 4	23 95
5	21 42 05	18 54 27 4	40 52	13	7 25 14 80	19 35 1 7	25 28
5	24 15 19	18 58 30 5	39 20	14	7 27 48 21	19 32 30 0	26 62
5	26 48 49	19 2 25 7	37 90	15	7 30 21 47	19 29 50 3	27 95
5	29 21 92	19 6 13 1	36 58	16	7 32 54 59	19 27 2 6	29 27
5	31 55 48	19 9 52 6	35 25	17	7 35 27 56	19 24 7 0	30 58
5	34 29 18	19 13 24 1	33 93	18	7 38 0 37	19 21 3 5	31 90
5	37 2 99	19 16 47 7	32 60	19	7 40 33 03	19 17 52 1	33 20
5	39 36 93	19 20 3 3	31 25	20	7 43 5 52	19 14 32 9	34 50
5	42 10 98	19 23 10 8	29 92	21	7 45 37 85	19 11 5 9	35 80
5	44 45 13	19 26 10 3	28 55	22	7 48 10 00	19 7 31 1	37 07
5	47 19 38	N. 19 29 1 6	27 20	23	7 50 41 98	N. 19 3 48 7	38 35
TUESDAY 14.				THURSDAY 16.			
5	49 53 73	N. 19 31 44 8	25 83	0	7 53 13 77	N. 18 59 58 6	39 62
5	52 28 17	19 34 19 8	24 48	1	7 55 45 38	18 56 0 9	40 87
5	55 2 68	19 36 46 7	23 10	2	7 58 16 79	18 51 55 7	42 12
5	57 37 28	19 39 5 3	21 72	3	8 0 48 01	18 47 43 0	43 38
6	0 11 94	19 41 15 6	20 35	4	8 3 19 03	18 43 22 7	44 60
6	2 46 67	19 43 17 7	18 98	5	8 5 49 85	18 38 55 1	45 83
6	5 21 46	19 45 11 6	17 58	6	8 8 20 47	18 34 20 1	47 05
6	7 56 29	19 46 57 1	16 20	7	8 10 50 87	18 29 37 8	48 25
6	10 31 18	19 48 34 3	14 82	8	8 13 21 06	18 24 48 3	49 47
6	13 6 10	19 50 3 2	13 42	9	8 15 51 04	18 19 51 5	50 67
6	15 41 06	19 51 23 7	12 03	10	8 18 20 79	18 14 47 5	51 83
6	18 16 04	19 52 35 9	10 63	11	8 20 50 32	18 9 36 5	53 02
6	20 51 04	19 53 39 7	9 23	12	8 23 19 63	18 4 18 4	54 18
6	23 26 06	19 54 35 1	7 85	13	8 25 48 71	17 58 53 3	55 33
6	26 1 09	19 55 22 2	6 43	14	8 28 17 55	17 53 21 3	56 48
6	28 36 11	19 56 0 8	5 05	15	8 30 46 16	17 47 42 4	57 62
6	31 11 14	19 56 31 1	3 65	16	8 33 14 53	17 41 56 7	58 75
6	33 46 15	19 56 53 0	2 25	17	8 35 42 66	17 36 4 2	59 85
6	36 21 15	19 57 6 5	0 85	18	8 38 10 55	17 30 5 1	60 97
6	38 56 12	19 57 11 6	0 53	19	8 40 38 19	17 23 59 3	62 05
6	41 31 06	19 57 8 4	1 95	20	8 43 5 59	17 17 47 0	63 13
6	44 5 97	19 56 56 7	3 33	21	8 45 32 73	17 11 28 2	64 22
6	46 40 84	19 56 36 7	4 73	22	8 47 59 62	17 5 2 9	65 27
6	49 15 66	19 56 8 3	6 12	23	8 50 26 26	16 58 31 3	66 32
6	51 50 43	N. 19 55 31 6		24	8 52 52 64	N. 16 51 53 4	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
FRIDAY 17.				SUNDAY 19.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	8 52 52.64	N. 16 51 53.4	67.35	0	10 44 48.23	N. 9 52 31.1
1	8 55 18.76	16 45 9.3	68.38	1	10 47 1.91	9 42 9.3
2	8 57 44.62	16 38 19.0	69.40	2	10 49 15.36	9 31 44.7
3	9 0 10.22	16 31 22.6	70.40	3	10 51 28.58	9 21 17.4
4	9 2 35.56	16 24 20.2	71.38	4	10 53 41.58	9 10 47.4
5	9 5 0.63	16 17 11.9	72.38	5	10 55 54.35	9 0 14.8
6	9 7 25.44	16 9 57.6	73.35	6	10 58 6.90	8 49 39.6
7	9 9 49.99	16 2 37.5	74.32	7	11 0 19.24	8 39 2.0
8	9 12 14.27	15 55 11.6	75.27	8	11 2 31.36	8 28 22.0
9	9 14 38.29	15 47 40.0	76.20	9	11 4 43.27	8 17 39.6
10	9 17 2.04	15 40 2.8	77.12	10	11 6 54.97	8 6 55.0
11	9 19 25.52	15 32 20.1	78.05	11	11 9 6.46	7 56 8.1
12	9 21 48.73	15 24 31.8	78.95	12	11 11 17.75	7 45 19.2
13	9 24 11.68	15 16 38.1	79.83	13	11 13 28.84	7 34 28.2
14	9 26 34.36	15 8 39.1	80.73	14	11 15 39.72	7 23 35.1
15	9 28 56.77	15 0 34.7	81.58	15	11 17 50.41	7 12 40.2
16	9 31 18.90	14 52 25.2	82.45	16	11 20 0.91	7 1 43.3
17	9 33 40.77	14 44 10.5	83.30	17	11 22 11.21	6 50 44.6
18	9 36 2.37	14 35 50.7	84.12	18	11 24 21.33	6 39 44.2
19	9 38 23.70	14 27 26.0	84.97	19	11 26 31.26	6 28 42.1
20	9 40 44.76	14 18 56.2	85.75	20	11 28 41.00	6 17 38.4
21	9 43 5.55	14 10 21.7	86.57	21	11 30 50.56	6 6 33.1
22	9 45 26.07	14 1 42.3	87.35	22	11 32 59.94	5 55 26.3
23	9 47 46.33	N. 13 52 58.2	88.12	23	11 35 9.15	N. 5 44 18.1
SATURDAY 18.				MONDAY 20.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	9 50 6.31	N. 13 44 9.5	88.88	0	11 37 18.18	N. 5 33 8.5
1	9 52 26.03	13 35 16.2	89.63	1	11 39 27.04	5 21 57.6
2	9 54 45.48	13 26 18.4	90.38	2	11 41 35.73	5 10 45.4
3	9 57 4.66	13 17 16.1	91.10	3	11 43 44.26	4 59 32.1
4	9 59 23.58	13 8 9.5	91.82	4	11 45 52.63	4 48 17.7
5	10 1 42.23	12 58 58.6	92.52	5	11 48 0.84	4 37 2.2
6	10 4 0.62	12 49 43.5	93.22	6	11 50 8.90	4 25 45.7
7	10 6 18.75	12 40 24.2	93.88	7	11 52 16.80	4 14 28.3
8	10 8 36.62	12 31 0.9	94.55	8	11 54 24.55	4 3 10.0
9	10 10 54.23	12 21 33.6	95.22	9	11 56 32.16	3 51 50.9
10	10 13 11.57	12 12 2.3	95.87	10	11 58 39.62	3 40 31.1
11	10 15 28.66	12 2 27.1	96.48	11	12 0 46.94	3 29 10.5
12	10 17 45.50	11 52 48.2	97.12	12	12 2 54.12	3 17 49.4
13	10 20 2.08	11 43 5.5	97.72	13	12 5 1.17	3 6 27.7
14	10 22 18.41	11 33 19.2	98.30	14	12 7 8.08	2 55 5.5
15	10 24 34.49	11 23 29.4	98.90	15	12 9 14.87	2 43 42.9
16	10 26 50.32	11 13 36.0	99.47	16	12 11 21.54	2 32 19.9
17	10 29 5.90	11 3 39.2	100.03	17	12 13 28.08	2 20 56.6
18	10 31 21.24	10 53 39.0	100.58	18	12 15 34.49	2 9 33.0
19	10 33 36.33	10 43 35.5	101.12	19	12 17 40.79	1 58 9.2
20	10 35 51.19	10 33 28.8	101.65	20	12 19 46.98	1 46 45.3
21	10 38 5.80	10 23 18.9	102.15	21	12 21 53.05	1 35 21.2
22	10 40 20.18	10 13 6.0	102.67	22	12 23 59.02	1 23 57.2
23	10 42 34.32	10 2 50.0	103.15	23	12 26 4.88	1 12 33.1
24	10 44 48.23	N. 9 52 31.1		24	12 28 10.64	N. 1 1 9.2



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 21.				THURSDAY 23.		
h m s	° ' "	"		h m s	° ' "	"
12 28 10.64	N. 1 1 9.2	113.97	0	14 7 39.57	S. 7 46 32.2	102.33
12 30 16.30	0 49 43.4	113.93	1	14 9 43.53	7 56 46.2	101.90
12 32 21.86	0 38 21.8	113.90	2	14 11 47.51	8 6 57.6	101.43
12 34 27.33	0 26 58.4	113.83	3	14 13 51.51	8 17 6.2	100.98
12 36 32.70	0 15 35.4	113.78	4	14 15 55.53	8 27 12.1	100.50
12 38 37.99	N. 0 4 12.7	113.72	5	14 17 59.58	8 37 15.1	100.03
12 40 43.19	S. 0 7 9.6	113.62	6	14 20 3.65	8 47 15.3	99.55
12 42 48.31	0 18 31.3	113.55	7	14 22 7.76	8 57 12.6	99.05
12 44 53.35	0 29 52.6	113.43	8	14 24 11.89	9 7 6.9	98.55
12 46 58.31	0 41 13.2	113.33	9	14 26 16.05	9 16 58.2	98.05
12 49 3.20	0 52 33.2	113.22	10	14 28 20.25	9 26 46.5	97.53
12 51 8.01	1 3 52.5	113.10	11	14 30 24.48	9 36 31.7	97.00
12 53 12.76	1 15 11.1	112.95	12	14 32 28.75	9 46 13.7	96.48
12 55 17.44	1 26 28.8	112.82	13	14 34 33.06	9 55 52.6	95.93
12 57 22.06	1 37 45.7	112.67	14	14 36 37.40	10 5 28.2	95.40
12 59 26.62	1 49 1.7	112.50	15	14 38 41.78	10 15 0.6	94.85
13 1 31.12	2 0 16.7	112.33	16	14 40 46.20	10 24 29.7	94.28
13 3 35.56	2 11 30.7	112.15	17	14 42 50.67	10 33 55.4	93.72
13 5 39.95	2 22 43.6	111.97	18	14 44 55.18	10 43 17.7	93.15
13 7 44.29	2 33 55.4	111.75	19	14 46 59.74	10 52 36.6	92.57
13 9 48.59	2 45 5.9	111.57	20	14 49 4.34	11 1 52.0	91.97
13 11 52.84	2 56 15.3	111.35	21	14 51 8.98	11 11 3.8	91.38
13 13 57.04	3 7 23.4	111.12	22	14 53 13.68	11 20 12.1	90.78
13 16 1.21	S. 3 18 30.1	110.88	23	14 55 18.43	S. 11 29 16.8	90.17
WEDNESDAY 22.				FRIDAY 24.		
h m s	° ' "	"		h m s	° ' "	"
13 18 5.34	S. 3 29 35.4	110.65	0	14 57 23.22	S. 11 38 17.8	89.55
13 20 9.44	3 40 39.3	110.40	1	14 59 28.07	11 47 15.1	88.92
13 22 13.50	3 51 41.7	110.13	2	15 1 32.97	11 56 8.6	88.30
13 24 17.54	4 2 42.5	109.88	3	15 3 37.92	12 4 58.4	87.67
13 26 21.54	4 13 41.8	109.60	4	15 5 42.93	12 13 44.4	87.00
13 28 25.53	4 24 39.4	109.32	5	15 7 47.98	12 22 26.4	86.37
13 30 29.49	4 35 35.3	109.02	6	15 9 53.10	12 31 4.6	85.72
13 32 33.43	4 46 29.4	108.72	7	15 11 58.27	12 39 38.9	85.05
13 34 37.35	4 57 21.7	108.42	8	15 14 3.49	12 48 9.2	84.37
13 36 41.26	5 8 12.2	108.08	9	15 16 8.78	12 56 35.4	83.72
13 38 45.16	5 19 0.7	107.77	10	15 18 14.12	13 4 57.7	83.02
13 40 49.04	5 29 47.3	107.48	11	15 20 19.51	13 13 15.8	82.33
13 42 52.92	5 40 31.9	107.08	12	15 22 24.97	13 21 29.8	81.65
13 44 56.79	5 51 14.4	106.78	13	15 24 30.49	13 29 39.7	80.93
13 47 0.66	6 1 54.8	106.38	14	15 26 36.06	13 37 45.3	80.23
13 49 4.52	6 12 33.1	106.00	15	15 28 41.69	13 45 46.7	79.53
13 51 8.39	6 23 9.1	105.63	16	15 30 47.39	13 53 43.9	78.80
13 53 12.25	6 33 42.9	105.25	17	15 32 53.14	14 1 36.7	78.08
13 55 16.13	6 44 14.4	104.85	18	15 34 58.95	14 9 25.2	77.37
13 57 20.01	6 54 43.5	104.45	19	15 37 4.82	14 17 9.4	76.62
13 59 23.89	7 5 10.2		20	15 39 10.76	14 24 49.1	75.87
14 1 27.79	7 15 34.5			15 41 16.75	14 32 24.3	75.13
14 3 31.70	7 25 56.1			43 22.80	14 39 55.1	74.38
14 5 35.63	7 36 15			15 28.92	14 47 21.4	73.62
14 7 39.57	S. 7 46 3			35.09	S. 14 54 43.1	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
SATURDAY 25.				MONDAY 27.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	15 47 35.09	S. 14 54 43.1	72.85	0	17 29 29.83	S. 19 9 43.0
1	15 49 41.32	15 2 0.2	72.10	1	17 31 37.99	19 12 49.8
2	15 51 47.61	15 9 12.8	71.30	2	17 33 46.16	19 15 50.9
3	15 53 53.97	15 16 20.6	70.53	3	17 35 54.33	19 18 46.3
4	15 56 0.38	15 23 23.8	69.75	4	17 38 2.51	19 21 36.1
5	15 58 6.85	15 30 22.3	68.95	5	17 40 10.69	19 24 20.2
6	16 0 13.37	15 37 16.0	68.17	6	17 42 18.87	19 26 53.6
7	16 2 19.96	15 44 5.0	67.35	7	17 44 27.04	19 29 31.4
8	16 4 26.60	15 50 49.1	66.57	8	17 46 35.21	19 31 58.1
9	16 6 33.30	15 57 28.5	65.73	9	17 48 43.38	19 34 19.3
10	16 8 40.06	16 4 2.9	64.93	10	17 50 51.54	19 36 33.4
11	16 10 46.87	16 10 32.5	64.10	11	17 52 59.69	19 38 45.4
12	16 12 53.74	16 16 57.1	63.28	12	17 55 7.83	19 40 49.6
13	16 15 0.67	16 23 16.8	62.43	13	17 57 15.95	19 42 48.1
14	16 17 7.65	16 29 31.4	61.62	14	17 59 24.06	19 44 40.9
15	16 19 14.68	16 35 41.1	60.78	15	18 1 32.16	19 46 27.9
16	16 21 21.76	16 41 45.8	59.93	16	18 3 40.23	19 48 9.2
17	16 23 28.90	16 47 45.4	59.08	17	18 5 48.28	19 49 44.8
18	16 25 36.09	16 53 39.9	58.23	18	18 7 56.31	19 51 14.7
19	16 27 43.33	16 59 29.3	57.37	19	18 10 4.32	19 52 38.9
20	16 29 50.62	17 5 13.5	56.52	20	18 12 12.29	19 53 57.3
21	16 31 57.95	17 10 52.6	55.67	21	18 14 20.24	19 55 9.9
22	16 34 5.34	17 16 26.6	54.78	22	18 16 28.16	19 56 16.9
23	16 36 12.77	S. 17 21 55.3	53.92	23	18 18 36.05	S. 19 57 18.1
SUNDAY 26.				TUESDAY 28.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	16 38 20.24	S. 17 27 18.8	53.05	0	18 20 43.90	S. 19 58 13.6
1	16 40 27.76	17 32 37.1	52.17	1	18 22 51.71	19 59 3.4
2	16 42 35.33	17 37 50.1	51.28	2	18 24 59.49	19 59 47.4
3	16 44 42.93	17 42 57.8	50.40	3	18 27 7.23	20 0 25.8
4	16 46 50.58	17 48 0.2	49.52	4	18 29 14.92	20 0 58.4
5	16 48 58.26	17 52 57.3	48.62	5	18 31 22.57	20 1 25.3
6	16 51 5.98	17 57 49.0	47.72	6	18 33 30.18	20 1 46.5
7	16 53 13.74	18 2 35.3	46.82	7	18 35 37.74	20 2 2.1
8	16 55 21.53	18 7 16.2	45.92	8	18 37 45.25	20 2 11.9
9	16 57 29.36	18 11 51.7	45.02	9	18 39 52.71	20 2 16.0
10	16 59 37.22	18 16 21.8	44.10	10	18 42 0.11	20 2 14.4
11	17 1 45.11	18 20 46.4	43.20	11	18 44 7.46	20 2 7.2
12	17 3 53.03	18 25 5.6	42.27	12	18 46 14.76	20 1 54.3
13	17 6 0.98	18 29 19.2	41.37	13	18 48 22.00	20 1 35.7
14	17 8 8.96	18 33 27.4	40.43	14	18 50 29.17	20 1 11.5
15	17 10 16.96	18 37 30.0	39.52	15	18 52 36.29	20 0 41.7
16	17 12 24.98	18 41 27.1	38.58	16	18 54 43.34	20 0 6.2
17	17 14 33.03	18 45 18.6	37.67	17	18 56 50.33	19 59 25.0
18	17 16 41.10	18 49 4.6	36.73	18	18 58 57.25	19 58 38.3
19	17 18 49.18	18 52 45.0	35.80	19	19 1 4.11	19 57 46.0
20	17 20 57.28	18 56 19.8	34.87	20	19 3 10.89	19 56 48.0
21	17 23 5.40	18 59 49.0	33.93	21	19 5 17.61	19 55 44.5
22	17 25 13.53	19 3 12.6	33.00	22	19 7 24.25	19 54 35.4
23	17 27 21.68	19 6 30.6	32.07	23	19 9 30.82	19
24	17 29 29.83	S. 19 9 43.0		24	19 11 37.31	S. 19



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .
WEDNESDAY 29.				FRIDAY 31.		
<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
9 11 37.31	S. 19 52 0.6	14.28	0	20 50 59.23	S. 17 4 46.9	54.93
9 13 43.72	19 50 34.9	15.22	1	20 53 0.90	16 59 17.3	55.70
9 15 50.06	19 49 3.6	16.12	2	20 55 2.47	16 53 43.1	56.43
9 17 56.31	19 47 26.9	17.03	3	20 57 3.94	16 48 4.4	57.18
9 20 2.49	19 45 44.7	17.95	4	20 59 5.31	16 42 21.3	57.93
9 22 8.58	19 43 57.0	18.87	5	21 1 6.57	16 36 33.7	58.68
9 24 14.59	19 42 3.8	19.77	6	21 3 7.74	16 30 41.6	59.40
9 26 20.51	19 40 5.2	20.67	7	21 5 8.80	16 24 45.2	60.15
9 28 26.35	19 38 1.2	21.57	8	21 7 9.76	16 18 44.3	60.87
9 30 32.10	19 35 51.8	22.47	9	21 9 10.63	16 12 39.1	61.58
9 32 37.76	19 33 37.0	23.37	10	21 11 11.40	16 6 29.6	62.32
9 34 43.33	19 31 16.8	24.27	11	21 13 12.07	16 0 15.7	63.02
9 36 48.81	19 28 51.2	25.15	12	21 15 12.65	15 53 57.6	63.73
9 38 54.20	19 26 20.3	26.03	13	21 17 13.12	15 47 35.2	64.43
9 40 59.49	19 23 44.1	26.92	14	21 19 13.49	15 41 8.6	65.13
9 43 4.69	19 21 2.6	27.78	15	21 21 13.77	15 34 37.8	65.83
9 45 9.80	19 18 15.9	28.68	16	21 23 13.95	15 28 2.8	66.53
9 47 14.81	19 15 23.8	29.55	17	21 25 14.04	15 21 23.6	67.20
9 49 19.72	19 12 26.5	30.42	18	21 27 14.04	15 14 40.4	67.90
9 51 24.54	19 9 24.0	31.30	19	21 29 13.95	15 7 53.0	68.58
9 53 29.25	19 6 16.2	32.15	20	21 31 13.76	15 1 1.5	69.25
9 55 33.87	19 3 3.3	33.02	21	21 33 13.49	14 54 6.0	69.92
9 57 38.39	18 59 45.2	33.83	22	21 35 13.13	14 47 6.5	70.58
9 59 42.80	S. 18 56 21.9	34.73	23	21 37 12.69	S. 14 40 3.0	71.25
THURSDAY 30.				SATURDAY, JUNE 1.		
20 1 47.12	S. 18 52 53.5	35.58	0	21 39 12.16	S. 14 32 55.5	
20 3 51.33	18 49 20.0	36.43				
20 5 55.14	18 45 41.4	37.28				
20 7 59.45	18 41 57.7	38.13				
20 10 3.35	18 38 8.9	38.95				
20 12 7.15	18 34 15.2	39.80				
20 14 10.85	18 30 16.4	40.63				
20 16 14.44	18 26 12.6	41.47				
20 18 17.92	18 22 3.8	42.28				
20 20 21.30	18 17 50.1	43.10				
20 22 24.57	18 13 31.5	43.92				
20 24 27.74	18 9 8.0	44.73				
20 26 30.80	18 4 39.6	45.55				
20 28 33.76	18 0 6.3	46.35				
20 30 36.61	17 55 28.2	47.15				
20 32 39.35	17 50 45.3	47.93				
20 34 41.98	17 45 57.7	48.75				
20 36 44.51	17 41 5.2	49.53				
20 38 46.93	17 36 8.0	50.30				
20 40 49.25	17 31 6.2	51.10				
20 42 51.46	17 25 59.6	51.83				
20 44 53.56	17 20 48.3	52.63				
20 46 55.56	17 15 32.5	53.42				
57.45	17 10 12.0	54.18				
23	S. 17 4 46.9					

## PHASES OF THE MOON.

☾ Last Quarter - <sup>d</sup> 3 <sup>h</sup> 22 <sup>m</sup> 45.6  
 ● New Moon - - 11 11 9.0  
 ☽ First Quarter - 18 3 52.4  
 ○ Full Moon - - 25 12 7.8

☾ Apogee - - - - - <sup>d</sup> 2 <sup>h</sup> 12  
 ☾ Perigee - - - - - 14 8  
 ☾ Apogee - - - - - 30 5



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	
		<sup>o</sup> <sup>i</sup> <sup>''</sup>		<sup>o</sup> <sup>i</sup> <sup>''</sup>		<sup>o</sup> <sup>i</sup> <sup>''</sup>		<sup>o</sup> <sup>i</sup> <sup>''</sup>	
1	Spica $\pi$ W.	77 3 26	3061	78 32 23	3067	80 1 13	3071	81 29 4	
	Antares W.	31 56 41	3239	33 22 4	3228	34 47 40	3219	36 13 4	
	Fomalhaut E.	57 25 20	3430	56 3 37	3449	54 42 16	3469	53 21 1	
	$\alpha$ Pegasi E.	72 37 3	3399	71 14 45	3410	69 52 40	3422	68 30 4	
	Saturn E.	96 3 44	3078	94 35 7	3083	93 6 37	3087	91 38 1	
	SUN E.	122 0 1	3424	120 38 12	3429	119 16 28	3434	117 51 3	
2	Spica $\pi$ W.	88 52 33	3091	90 20 54	3093	91 49 12	3094	93 17 2	
	Antares W.	43 24 12	3184	44 50 40	3181	46 17 12	3176	47 43 3	
	Fomalhaut E.	46 42 47	3618	45 24 32	3648	44 6 49	3682	42 49 4	
	$\alpha$ Pegasi E.	61 45 10	3502	60 24 48	3517	59 4 43	3533	57 44 3	
	Saturn E.	84 17 21	3109	82 49 22	3110	81 21 25	3111	79 53 2	
	SUN E.	111 7 41	3454	109 46 25	3453	108 25 10	3456	107 3 5	
3	Antares W.	54 58 11	3151	56 25 19	3146	57 52 33	3142	59 19 3	
	$\alpha$ Pegasi E.	51 10 49	3649	49 53 7	3672	48 35 50	3699	47 19 4	
	Saturn E.	72 33 59	3110	71 6 2	3109	69 38 3	3106	68 10 1	
	SUN E.	100 17 56	3454	98 56 40	3452	97 35 22	3449	96 14 1	
4	Antares W.	66 38 12	3105	68 6 15	3098	69 34 27	3092	71 2 4	
	$\alpha$ Pegasi E.	41 3 29	3918	39 50 28	3969	38 38 18	4028	37 27 6	
	Saturn E.	60 48 50	3083	59 20 19	3077	57 51 41	3070	56 22 5	
	SUN E.	89 26 12	3423	88 4 21	3416	86 42 23	3410	85 20 13	
5	Antares W.	78 27 3	3039	79 56 27	3029	81 26 4	3019	82 55 3	
	$\alpha$ Aquilæ W.	39 7 44	4584	40 10 23	4476	41 14 36	4375	42 20 20	
	Saturn E.	48 56 55	3025	47 27 13	3015	45 57 19	3006	44 27 14	
	SUN E.	78 27 39	3360	77 4 37	3350	75 41 23	3340	74 17 58	
6	Antares W.	90 28 26	2951	91 59 40	2938	93 31 11	2926	95 2 57	
	$\alpha$ Aquilæ W.	48 8 23	3918	49 21 25	3859	50 35 26	3804	51 50 24	
	Saturn E.	36 53 27	2940	35 21 59	2928	33 50 16	2916	32 18 17	
	SUN E.	67 17 33	3269	65 52 45	3256	64 27 42	3242	63 2 23	
7	Antares W.	102 45 57	2845	104 19 26	2832	105 53 12	2818	107 27 17	
	$\alpha$ Aquilæ W.	58 18 9	3528	59 38 2	3489	60 58 38	3453	62 19 53	
	Saturn E.	24 34 19	2839	23 0 42	2825	21 26 47	2814	19 52 37	
	SUN E.	55 51 38	3157	54 24 37	3142	52 57 18	3126	51 29 48	
8	$\alpha$ Aquilæ W.	69 15 50	3262	70 40 46	3234	72 6 15	3207	73 32 16	
	Fomalhaut W.	35 31 54	3546	36 51 27	3466	38 12 29	3392	39 34 53	
	SUN E.	44 6 50	3035	42 37 20	3019	41 7 31	3004	39 37 23	
9	Fomalhaut W.	46 44 44	3058	48 13 45	3016	49 43 38	2976	51 14 21	
	$\alpha$ Pegasi W.	34 18 15	3748	35 34 11	3636	36 52 7	3536	38 11 51	
	SUN E.	32 2 19	2924	30 30 30	2912	28 58 26	2902	27 26 10	
13	SUN W.	21 10 35	2599	22 49 31	2579	24 28 55	2563	26 8 41	
	Pollux E.	39 40 56	2317	37 55 21	2325	36 9 58	2335	34 24 50	
	Mars E.	46 23 32	2358	44 38 57	2355	42 54 18	2353	41 9 35	
	Regulus E.	74 48 49	2178	72 59 48	2175	71 10 42	2171	69 21 31	
	Jupiter E.	90 12 16	2181	88 23 20	2171			84 45 13	
14	SUN W.	34 31 18	2510	36 12 17					
	Venus W.	16 29 7	2758	18 4 1					



## MEAN TIME.

## LUNAR DISTANCES.

the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>	
1	Spica $\pi$ W.	82 58 37	3079	84 27 12	3083	85 55 43	3086	87 24 10	3089
	Antares W.	37 39 21	3203	39 5 24	3199	40 31 34	3194	41 57 50	3189
	Fomalhaut E.	52 0 43	3513	50 40 33	3537	49 20 50	3562	48 1 34	3588
	$\alpha$ Pegasi E.	67 9 12	3447	65 47 49	3461	64 26 41	3473	63 5 47	3488
	Saturn E.	90 9 53	3096	88 41 39	3100	87 13 30	3103	85 45 24	3105
	Sun E.	116 33 16	3442	115 11 47	3446	113 50 22	3448	112 29 0	3451
2	Spica $\pi$ W.	94 45 44	3096	96 13 58	3096	97 42 13	3096	99 10 27	3096
	Antares W.	49 10 32	3168	50 37 19	3164	52 4 11	3159	53 31 9	3156
	Fomalhaut E.	41 33 15	3758	40 17 29	3802	39 2 29	3850	37 48 18	3903
	$\alpha$ Pegasi E.	56 25 25	3566	55 6 14	3586	53 47 24	3605	52 28 55	3626
	Saturn E.	78 25 35	3114	76 57 42	3113	75 29 48	3113	74 1 54	3112
	Sun E.	105 42 45	3458	104 21 34	3457	103 0 22	3457	101 39 10	3455
3	Antares W.	60 47 18	3130	62 14 51	3125	63 42 30	3119	65 10 17	3112
	$\alpha$ Pegasi E.	46 2 44	3758	44 46 58	3793	43 31 49	3830	42 17 18	3871
	Saturn E.	66 41 56	3101	65 13 47	3096	63 45 33	3092	62 17 14	3088
	Sun E.	94 52 37	3442	93 31 8	3438	92 9 35	3433	90 47 56	3429
4	Antares W.	72 31 18	3075	73 59 58	3067	75 28 48	3057	76 57 50	3048
	$\alpha$ Pegasi E.	36 16 56	4165	35 7 57	4248	34 0 16	4343	32 54 3	4449
	Saturn E.	54 54 2	3057	53 25 0	3049	51 55 48	3042	50 26 27	3033
	Sun E.	83 58 5	3395	82 35 43	3387	81 13 12	3379	79 50 31	3369
5	Antares W.	84 25 56	2998	85 56 12	2986	87 26 42	2975	88 57 26	2962
	$\alpha$ Aquilæ W.	43 27 27	4200	44 35 53	4121	45 45 34	4049	46 56 25	3981
	Saturn E.	42 56 55	2985	41 26 24	2974	39 55 39	2963	38 24 40	2952
	Sun E.	72 54 20	3318	71 30 29	3306	70 6 24	3294	68 42 6	3282
6	Antares W.	96 34 59	2900	98 7 18	2887	99 39 53	2873	101 12 47	2860
	$\alpha$ Aquilæ W.	53 6 17	3702	54 23 2	3655	55 40 37	3611	56 59 0	3568
	Saturn E.	30 46 3	2891	29 13 32	2877	27 40 44	2865	26 7 40	2852
	Sun E.	61 36 48	3215	60 10 57	3200	58 44 48	3186	57 18 22	3171
7	Antares W.	109 1 40	2790	110 36 21	2776	112 11 20	2762	113 46 38	2747
	$\alpha$ Aquilæ W.	63 41 51	3384	65 4 26	3351	66 27 38	3319	67 51 27	3290
	Saturn E.	18 18 11	2790	16 43 30	2779	15 8 35	2772	13 33 30	2766
	Sun E.	50 1 44	3095	48 33 29	3080	47 4 55	3065	45 36 2	3049
8	$\alpha$ Aquilæ W.	74 58 48	3157	76 25 49	3134	77 53 18	3110	79 21 15	3088
	Fomalhaut W.	40 58 37	3263	42 23 32	3205	43 49 35	3153	45 16 40	3105
	Sun E.	38 6 57	2975	36 36 13	2961	35 5 11	2948	33 33 53	2935
9	Fomalhaut W.	52 45 51	2903	54 18 6	2870	55 51 3	2838	57 24 41	2808
	$\alpha$ Pegasi W.	39 33 17	3362	40 56 17	3288	42 20 42	3221	43 46 26	3158
	Sun E.	25 53 43	2887	24 21 8	2884	22 48 28	2883	21 15 47	2884
3	Sun W.	27 48 47	2538	29 29 7	2528	31 9 41	2521	32 50 25	2515
	Pollux E.	32 40 1	2365	30 55 36	2385	29 11 40	2411	27 28 21	2443
	Mars E.	39 24 49	2350	37 40 2	2349	35 55 14	2350	34 10 27	2351
	Regulus E.	67 32 15	2166	65 42 56	2164	63 53 35	2163	62 4 11	2162
	$\beta$ E.	82 56 2	2170	81 6 49	2163	79 17 33	2166	77 28 15	2166
	W.	41 15 42	2501	42 56 54	2500	44 38 7	2500	46 19 20	2502
	$\alpha$ E.	54 36	2661	54 32 8	2649	56 9 56	2641	57 47 55	2635



MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Star's Name and Position.			Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
				<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>
14	Mars	E.		32 25 41	2353	30 40 58	2355	28 56 19	2359	27 11 4
	Regulus	E.		60 14 46	2162	58 25 21	2162	56 35 56	2163	54 46 3
	Jupiter	E.		75 38 56	2166	73 49 37	2167	72 0 19	2167	70 11
15	SUN	W.		48 0 30	2503	49 41 39	2506	51 22 44	2509	53 3 4
	Venus	W.		29 26 3	2631	31 4 16	2627	32 42 31	2627	34 20 5
	Regulus	E.		45 40 8	2175	43 51 3	2179	42 2 4	2183	40 13 1
	Jupiter	E.		61 5 13	2181	59 16 16	2184	57 27 25	2188	55 38 3
16	SUN	W.		61 27 26	2535	63 7 50	2542	64 48 5	2548	66 28 13
	Venus	W.		42 32 8	2638	44 10 11	2643	45 48 8	2647	47 25 5
	Regulus	E.		31 10 29	2213	29 22 21	2220	27 34 23	2226	25 46 3
	Jupiter	E.		46 36 41	2220	44 48 43	2225	43 0 53	2233	41 13 14
	Spica $\pi$	E.		85 2 21	2241	83 14 55	2248	81 27 39	2255	79 40 33
17	SUN	W.		74 46 24	2591	76 25 31	2599	78 4 28	2607	79 43 13
	Venus	W.		55 33 11	2686	57 10 10	2693	58 46 59	2701	60 23 38
	Pollux	W.		21 4 46	2686	22 41 43	2636	24 19 51	2597	25 58 56
	Jupiter	E.		32 17 33	2277	30 30 59	2284	28 44 36	2293	26 58 26
	Spica $\pi$	E.		70 47 43	2300	69 1 44	2309	67 15 57	2318	65 30 24
18	SUN	W.		87 54 5	2660	89 31 39	2669	91 9 1	2678	92 46 11
	Venus	W.		68 24 8	2751	69 59 40	2760	71 35 0	2769	73 10 8
	Pollux	W.		34 21 13	2498	36 2 29	2493	37 43 52	2490	39 25 19
	Mars	W.		23 16 3	2547	24 56 11	2552	26 36 12	2556	28 16 7
	Spica $\pi$	E.		56 45 56	2375	55 1 45	2385	53 17 49	2396	51 34 5
19	SUN	W.		100 48 48	2735	102 24 42	2745	104 0 22	2754	105 35 50
	Venus	W.		81 2 45	2825	82 36 40	2835	84 10 22	2845	85 43 52
	Pollux	W.		47 52 27	2499	49 33 42	2502	51 14 52	2507	52 55 55
	Mars	W.		36 33 24	2600	38 12 20	2607	39 51 6	2615	41 29 41
	Spica $\pi$	E.		42 59 49	2467	41 17 49	2481	39 36 9	2494	37 54 47
	Antares	E.		88 54 5	2461	87 11 57	2470	85 30 1	2480	83 48 19
20	SUN	W.		113 29 53	2814	115 4 3	2824	116 38 0	2834	118 11 44
	Venus	W.		93 28 14	2903	95 0 29	2913	96 32 32	2923	98 4 22
	Pollux	W.		61 19 14	2543	62 59 28	2550	64 39 32	2556	66 19 27
	Mars	W.		49 39 43	2666	51 17 9	2675	52 54 22	2684	54 31 21
	Regulus	W.		24 56 49	2475	26 38 37	2484	28 20 13	2492	30 1 37
	Antares	E.		75 23 4	2536	73 42 41	2546	72 2 32	2557	70 22 31
21	SUN	W.		125 57 6	2895	127 29 31	2905	129 1 43	2916	130 33 4
	Venus	W.		105 40 25	2981	107 11 1	2992	108 41 24	3002	110 11 3
	Mars	W.		62 33 33	2738	64 9 23	2746	65 45 2	2755	67 20 2
	Regulus	W.		38 25 31	2546	40 5 41	2554	41 45 39	2563	43 25 2
	Jupiter	W.		22 52 16	2559	24 32 8	2567	26 11 48	2576	27 51 1
	Antares	E.		62 6 39	2620	60 28 11	2632	58 49 59	2643	57 12
22	Mars	W.		75 14 46	2809	76 49 2	2818	78 23 7	2828	79 56 5
	Regulus	W.		51 41 16	2615	53 19 50	2624	54 58 13	2632	56 36 2
	Jupiter	W.		36 5 31		37 43 54	2637	39 21 59	2646	40 59 5
	Antares	E.		49 6 21				45 54 15	2748	44 18 3
	$\alpha$ Aquilæ	E.		96 47				52 47	3158	92 25 4
23	Mars	W.		87 43					2999	92 27



## MEAN TIME.

## LUNAR DISTANCES.

the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
4	Mars E.	25 27 20	2370	23 43 2	2378	21 58 56	2388	20 15 4	2400
	Regulus E.	52 57 9	2163	51 7 49	2167	49 18 32	2169	47 29 18	2172
	Jupiter E.	68 21 45	2170	66 32 32	2172	64 43 22	2174	62 54 15	2177
5	SUN W.	54 41 41	2517	56 25 31	2520	58 6 17	2523	59 46 55	2530
	Venus W.	35 59 12	2627	37 37 31	2629	39 15 47	2631	40 54 0	2635
	Regulus E.	38 24 23	2192	36 35 43	2197	34 47 11	2202	32 58 46	2207
	Jupiter E.	53 50 1	2197	52 1 29	2202	50 13 5	2208	48 24 49	2213
6	SUN W.	68 8 10	2561	69 47 58	2568	71 27 37	2575	73 7 6	2583
	Venus W.	49 3 42	2659	50 41 17	2665	52 18 44	2671	53 56 3	2679
	Regulus E.	23 58 55	2239	22 11 26	2246	20 24 7	2254	18 37 0	2262
	Jupiter E.	39 25 44	2246	37 38 25	2254	35 51 17	2260	34 4 19	2268
	Spica $\pi$ E.	77 53 37	2268	76 6 51	2277	74 20 17	2284	72 33 54	2292
7	SUN W.	81 21 47	2624	83 0 9	2632	84 38 20	2641	86 16 19	2651
	Venus W.	62 0 6	2717	63 36 23	2726	65 12 29	2734	66 48 24	2742
	Pollux W.	27 38 29	2545	29 18 39	2553	30 59 14	2561	32 40 7	2568
	Jupiter E.	25 12 27	2309	23 26 41	2318	21 41 8	2326	19 55 47	2336
	Spica $\pi$ E.	63 45 3	2335	61 59 55	2346	60 15 2	2355	58 30 22	2364
8	SUN W.	94 23 7	2696	95 59 52	2707	97 36 23	2716	99 12 42	2726
	Venus W.	74 45 4	2789	76 19 47	2797	77 54 19	2807	79 28 38	2816
	Pollux W.	41 6 47	2489	42 48 16	2490	44 29 43	2492	46 11 7	2495
	Mars W.	29 55 53	2569	31 35 30	2576	33 14 58	2583	34 54 16	2591
	Spica $\pi$ E.	49 50 44	2418	48 7 35	2429	46 24 42	2442	44 42 7	2454
9	SUN W.	107 11 4	2774	108 46 6	2784	110 20 55	2794	111 55 31	2805
	Venus W.	87 17 9	2864	88 50 14	2873	90 23 7	2883	91 55 47	2894
	Pollux W.	54 36 51	2518	56 17 39	2523	57 58 20	2530	59 38 51	2536
	Mars W.	43 8 5	2632	44 46 17	2641	46 24 17	2649	48 2 6	2658
	Spica $\pi$ E.	36 13 47	2525	34 33 8	2542	32 52 53	2559	31 13 2	2579
	Antares E.	82 6 49	2498	80 25 33	2507	78 44 30	2517	77 3 40	2527
10	SUN W.	119 45 14	2854	121 18 32	2864	122 51 37	2875	124 24 28	2885
	Venus W.	99 35 59	2943	101 7 24	2952	102 38 37	2962	104 9 37	2972
	Pollux W.	67 59 11	2571	69 38 46	2579	71 18 10	2587	72 57 23	2594
	Mars W.	56 8 13	2702	57 44 51	2711	59 21 17	2720	60 57 31	2729
	Regulus W.	31 42 48	2510	33 23 47	2519	35 4 34	2528	36 45 9	2537
	Antares E.	68 42 57	2577	67 3 31	2588	65 24 19	2598	63 45 21	2610
11	SUN W.	132 5 26	2938	133 36 57	2949	135 8 14	2959	136 39 18	2971
	Venus W.	111 41 34	3022	113 11 20	3032	114 40 53	3041	116 10 15	3052
	Mars W.	68 55 44	2773	70 30 47	2782	72 5 38	2791	73 40 18	2800
	Regulus W.	45 4 59	2580	46 44 21	2589	48 23 31	2597	50 2 30	2607
	Jupiter W.	29 30 32	2593	31 9 36	2602	32 48 29	2611	34 27 9	2619
	Antares E.	55 34 21	2667	53 56 57	2679	52 19 49	2692	50 42 59	2705
12	Mars W.	81 30 41	2845	83 4 10	2854	84 37 28	2863	86 10 34	2872
	Regulus W.	58 14 23	2650	59 52 10	2658	61 29 46	2667	63 7 10	2676
	Jupiter W.	42 37 33	2663	44 15 2	2672	45 52 19	2681	47 29 25	2690
	Antares E.	42 43 23	2781	41 8 30	2798	39 33 59	2816	37 59 52	2836
	Aquilæ W.	90 59 0	3175	89 32 21	3183	88 5 52	3194	86 39 36	3204
	W.	93 53 12	2917	95 25 9	2927	96 56 54	2935	98 28 28	2945



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .
23	Regulus W.	64 44 22 2684	66 21 23 2693	67 58 12 2702	69 34 4			
	Jupiter W.	49 6 19 2699	50 43 1 2708	52 19 31 2716	53 53 5			
	Antares E.	36 26 11 2857	34 52 57 2880	33 20 13 2906	31 48 4			
	$\alpha$ Aquilæ E.	85 13 31 3215	83 47 40 3227	82 22 3 3240	80 56 4			
24	Mars W.	99 59 50 2954	101 31 1 2962	103 2 1 2972	104 32 4			
	Regulus W.	77 35 4 2753	79 10 33 2763	80 45 50 2772	82 20 5			
	Jupiter W.	61 54 28 2769	63 29 37 2778	65 4 34 2786	66 39 2			
	Spica $\eta$ W.	24 34 51 2913	26 6 53 2903	27 39 5 2900	29 11 2			
	Antares E.	24 17 26 3139	22 50 4 3202	21 23 57 3278	19 59 2			
	$\alpha$ Aquilæ E.	73 54 12 3335	72 30 41 3353	71 7 31 3374	69 44 4			
25	Regulus W.	90 13 35 2823	91 47 33 2832	93 21 20 2840	94 54 5			
	Jupiter W.	74 30 17 2839	76 3 54 2847	77 37 21 2856	79 10 3			
	Spica $\eta$ W.	36 53 27 2901	38 25 45 2903	39 58 0 2908	41 30 1			
	$\alpha$ Aquilæ E.	62 57 20 3521	61 37 19 3550	60 17 50 3581	58 58 5			
	Fomalhaut E.	95 15 24 3089	93 47 1 3097	92 18 48 3105	90 50 4			
26	Jupiter W.	86 54 6 2907	88 26 16 2916	89 58 15 2924	91 30 4			
	Spica $\eta$ W.	49 9 23 2939	50 40 52 2945	52 12 14 2951	53 43 2			
	$\alpha$ Aquilæ E.	52 34 8 3818	51 19 24 3867	50 5 31 3919	48 52 3			
	Fomalhaut E.	83 33 2 3158	82 6 3 3169	80 39 17 3179	79 12 4			
	$\alpha$ Pegasi E.	98 40 54 3230	97 15 20 3237	95 49 54 3242	94 24 3			
27	Jupiter W.	99 6 35 2971	100 37 24 2978	102 8 4 2986	103 38 3			
	Spica $\eta$ W.	61 17 39 2989	62 48 5 2996	64 18 23 3002	65 48 3			
	Antares W.	17 23 43 3638	18 41 36 3645	20 1 10 3673	21 22 4			
	Fomalhaut E.	72 3 13 3248	70 38 1 3262	69 13 5 3274	67 48 23			
	$\alpha$ Pegasi E.	87 20 5 3288	85 55 39 3296	84 31 23 3306	83 7 18			
	Saturn E.	114 44 6 2991	113 13 42 2998	111 43 26 3006	110 13 20			
28	Spica $\eta$ W.	73 17 34 3038	74 47 0 3043	76 16 19 3048	77 45 32			
	Antares W.	28 19 5 3260	29 44 3 3243	31 9 21 3230	32 34 54			
	Fomalhaut E.	60 49 7 3364	59 26 9 3382	58 3 32 3399	56 41 14			
	$\alpha$ Pegasi E.	76 9 36 3365	74 46 40 3376	73 23 56 3388	72 1 26			
	Saturn E.	102 44 52 3044	101 15 34 3050	99 46 23 3056	98 17 19			
29	Spica $\eta$ W.	85 10 8 3076	86 38 47 3079	88 7 22 3083	89 35 52			
	Antares W.	39 45 20 3183	41 11 47 3181	42 38 19 3177	44 4 55			
	$\alpha$ Pegasi E.	65 12 23 3466	63 51 21 3480	62 30 34 3496	61 10 5			
	Saturn E.	90 53 34 3085	89 25 6 3088	87 56 42 3091	86 28 22			
	Sun E.	140 48 15 3449	139 26 54 3452	138 5 36 3454	136 44 21			
30	Antares W.	51 18 46 3162	52 45 40 3159	54 12 38 3158	55 39 38			
	$\alpha$ Pegasi E.	54 32 25 3606	53 13 57 3629	51 55 54 3653	50 38 17			
	Saturn E.	79 7 37 3106	77 30 35 3108	76 11 35 3109	74 43 37			
	$\alpha$ Arietis E.	96 30 54 3220	95 17 16 3221	93 39 23 3221	92 13 39			
	Sun E.	129 58 29 3462	128 16 16 3462	126 16 16 3462	125 55 9			
31	Antares W.	62 55 29 3140	61 42 13 3133	60 29 13 3126	59 17 46			
	$\alpha$ Pegasi E.	44 17 46 3843	42 54 13 3843	41 41 13 3843	40 28 7			
	Saturn E.	67 23 42 3106	66 10 13 3106	64 57 13 3106	63 44 28			
	$\alpha$ Arietis E.	85 4 55 3219	84 11 13 3219	82 58 13 3219	81 45 13			
	Sun E.	119 9 24 3455	117 56 13 3455	116 43 13 3455	115 30 28			



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>h</sup> .	P.L. of diff.	XVIII <sup>h</sup> .	P.L. of diff.	XXI <sup>h</sup> .	P.L. of diff.
		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>	
23	Regulus W.	71 11 15	2719	72 47 30	2728	74 23 33	2737	75 59 24	2746
	Jupiter W.	55 31 57	2734	57 7 52	2742	58 43 36	2751	60 19 8	2760
	Antares E.	30 16 26	2965	28 45 29	3001	27 15 17	3039	25 45 53	3086
	α Aquilæ E.	79 31 36	3268	78 6 47	3283	76 42 16	3300	75 18 4	3317
24	Mars W.	106 3 26	2990	107 33 51	2999	109 4 5	3008	110 34 8	3018
	Regulus W.	83 55 49	2789	85 30 32	2797	87 5 4	2805	88 39 25	2814
	Jupiter W.	68 13 54	2804	69 48 17	2813	71 22 28	2821	72 56 28	2830
	Spica ♀ W.	30 43 47	2895	32 16 13	2895	33 48 39	2895	35 21 4	2897
	Antares E.	18 36 29	3484	17 15 47	3628	15 57 43	3814	14 42 55	4061
	α Aquilæ E.	68 22 22	3417	67 0 25	3441	65 38 55	3466	64 17 53	3492
25	Regulus W.	96 28 21	2856	98 1 36	2866	99 34 39	2873	101 7 32	2882
	Jupiter W.	80 43 40	2874	82 16 32	2882	83 49 14	2891	85 21 45	2898
	Spica ♀ W.	43 2 13	2916	44 34 11	2922	46 6 2	2928	47 37 46	2933
	α Aquilæ E.	57 40 37	3650	56 22 57	3688	55 5 57	3728	53 49 40	3771
	Fomalhaut E.	89 22 50	3122	87 55 7	3130	86 27 34	3139	85 0 12	3149
26	Jupiter W.	93 1 42	2940	94 33 10	2948	96 4 28	2955	97 35 37	2964
	Spica ♀ W.	55 14 34	2963	56 45 33	2970	58 16 23	2977	59 47 5	2983
	α Aquilæ E.	47 40 29	4039	46 29 28	4106	45 19 32	4178	44 10 45	4256
	Fomalhaut E.	77 46 22	3201	76 20 14	3213	74 54 20	3224	73 28 39	3237
	α Pegasi E.	92 59 24	3256	91 34 21	3263	90 9 26	3271	88 44 41	3279
27	Jupiter W.	105 8 55	3000	106 39 8	3006	108 9 13	3014	109 39 9	3020
	Spica ♀ W.	67 18 37	3014	68 48 32	3020	70 18 20	3026	71 48 0	3031
	Antares W.	22 44 2	3371	24 6 52	3384	25 30 24	3394	26 54 31	3401
	Fomalhaut E.	66 23 58	3302	64 59 49	3317	63 35 57	3332	62 12 23	3348
	α Pegasi E.	81 43 23	3324	80 19 39	3333	78 56 6	3344	77 32 45	3354
	Saturn E.	108 43 22	3018	107 13 32	3026	105 43 51	3032	104 14 18	3038
28	Spica ♀ W.	79 14 39	3058	80 43 40	3063	82 12 35	3068	83 41 24	3072
	Antares W.	34 0 40	3210	35 26 38	3203	36 52 44	3195	38 18 59	3190
	Fomalhaut E.	55 19 18	3438	53 57 44	3458	52 36 33	3480	51 15 47	3504
	α Pegasi E.	70 39 8	3412	69 17 5	3424	67 55 16	3438	66 33 42	3451
	Saturn E.	96 48 22	3066	95 19 31	3072	93 50 47	3076	92 22 8	3080
29	Spica ♀ W.	91 4 18	3090	92 32 40	3092	94 0 59	3094	95 29 16	3097
	Antares W.	45 31 35	3172	46 58 18	3169	48 25 4	3166	49 51 54	3164
	α Pegasi E.	59 49 53	3529	58 30 1	3546	57 10 28	3566	55 51 16	3585
	Saturn E.	85 0 7	3098	83 31 55	3101	82 3 47	3103	80 35 41	3105
	Sun E.	135 23 7	3458	134 1 56	3459	132 40 46	3460	131 19 37	3461
30	Antares W.	57 6 42	3153	58 33 48	3149	60 0 58	3146	61 28 12	3143
	α Pegasi E.	49 21 7	3706	48 4 26	3737	46 48 18	3769	45 32 43	3805
	Saturn E.	73 15 38	3109	71 47 40	3109	70 19 42	3108	68 51 42	3108
	α Arietis E.	90 47 54	3221	89 22 10	3220	87 56 25	3220	86 30 40	3220
	Sun E.	124 34 2	3462	123 12 55	3460	121 51 46	3459	120 30 36	3457
	Antares W.	68 45 22	3124	70 13 3	3119	71 40 49	3114	73 8 42	3108
	α Pegasi E.	39 25 12	4041	38 14 13	4106	37 4 17	4177	35 55 29	4258
	Saturn E.	61 31 17	3096	60 3 2	3092	58 34 43	3089	57 6 20	3083
	α Arietis E.	79 21 40	3214	77 55 47	3212	76 29 52	3210	75 3 55	3207
	Sun E.	113 44 6	3441	112 22 36	3438	111 1 2	3433	109 39 23	3427



## CONFIGURATIONS OF THE SATELLITES OF JUPITER,

At 9<sup>h</sup>, MEAN TIME.

Day of the Month.	West.	East.
1	1 ●	○ <sup>2</sup> 3 <sup>4</sup>
2		3 <sup>2</sup> 1 <sup>4</sup> ○
3	2 ●	○ 1 <sup>4</sup>
4		3 <sup>2</sup> 1 <sup>4</sup> ○ 2 <sup>4</sup>
5		2 <sup>4</sup> ○ 1 <sup>4</sup>
6		3 <sup>2</sup> 1 <sup>4</sup> ○ 3 <sup>4</sup>
7		4 <sup>4</sup> ○ 1 <sup>4</sup> 2 <sup>4</sup> 3 <sup>4</sup>
8	4 <sup>4</sup>	1 <sup>4</sup> ○ 2 <sup>4</sup> 3 <sup>4</sup>
9	4 <sup>4</sup>	3 <sup>2</sup> 1 <sup>4</sup> ○
10	4 <sup>4</sup> 3 <sup>4</sup>	○ 1 <sup>4</sup>
11	4 <sup>4</sup>	3 <sup>2</sup> 1 <sup>4</sup> ○ 2 <sup>4</sup>
12	4 <sup>4</sup>	2 <sup>4</sup> ○ 1 <sup>4</sup>
13		4 <sup>4</sup> 2 <sup>4</sup> 1 <sup>4</sup> ○ 3 <sup>4</sup>
14		1 <sup>4</sup> ○ 2 <sup>4</sup> 3 <sup>4</sup> 4 <sup>4</sup>
15		1 <sup>4</sup> ○ 2 <sup>4</sup> 3 <sup>4</sup> 4 <sup>4</sup>
16		2 <sup>4</sup> 3 <sup>4</sup> ○ 1 <sup>4</sup> 4 <sup>4</sup>
17	1 ●	3 <sup>4</sup> ○ 2 <sup>4</sup> 4 <sup>4</sup>
18		3 <sup>2</sup> 1 <sup>4</sup> ○ 2 <sup>4</sup> 4 <sup>4</sup>
19		2 <sup>4</sup> ○ 3 <sup>4</sup> 1 <sup>4</sup> 4 <sup>4</sup>
20		3 <sup>2</sup> 1 <sup>4</sup> ○ 3 <sup>4</sup> 4 <sup>4</sup>
21		○ 1 <sup>4</sup> 2 <sup>4</sup> 3 <sup>4</sup> 4 <sup>4</sup>
22		1 <sup>4</sup> ○ 4 <sup>4</sup> 2 <sup>4</sup> 3 <sup>4</sup>
23		2 <sup>4</sup> 3 <sup>4</sup> ○ 1 <sup>4</sup>
24		3 <sup>2</sup> 1 <sup>4</sup> ○ 2 <sup>4</sup>
25	4 <sup>4</sup>	3 <sup>2</sup> 1 <sup>4</sup> ○ 2 <sup>4</sup>
26	4 <sup>4</sup>	3 <sup>2</sup> 1 <sup>4</sup> ○ 1 <sup>4</sup>
27	4 <sup>4</sup>	2 <sup>4</sup> 1 <sup>4</sup> ○ 3 <sup>4</sup>
28	4 <sup>4</sup>	○ 2 <sup>4</sup> 1 <sup>4</sup> 3 <sup>4</sup>
29	4 <sup>4</sup>	1 <sup>4</sup> ○ 2 <sup>4</sup> 3 <sup>4</sup>
30		3 <sup>2</sup> 1 <sup>4</sup> ○ 2 <sup>4</sup>
31	3 <sup>4</sup>	2 <sup>4</sup> 1 <sup>4</sup> ○ 4 <sup>4</sup>

This Table represents, at 9<sup>h</sup> after *Mean Noon* of each day of the month, the relative position of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the page; the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the direction of their motions, which are in all cases to be considered as *towards the sun*. At its greatest elongation, the point is placed above or below the centre of circle (○) at the left or right hand of the page, denotes that the Satellite is on the disc of Jupiter, and a black circle (●) that it is either behind or in front of Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

ELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.	1*	11 35 25.8	14 13 33.9	Em.
	3	6 4 4.5	8 49 11.2	Em.
	5	0 32 41.3	3 24 46.7	Em.
	6	19 1 18.9	22 0 22.9	Em.
	8*	13 29 56.8	16 35 59.5	Em.
	10†	7 58 36.8	11 11 38.3	Em.
	12	2 27 14.2	5 47 14.4	Em.
	13	20 55 52.9	0 22 51.6	Em.
	15	15 24 31.3	18 58 28.8	Em.
	17*	9 53 12.6	13 34 8.8	Em.
	19	4 21 50.5	8 9 45.3	Em.
	20	22 50 30.2	2 45 23.7	Em.
	22	17 19 9.2	21 21 1.4	Em.
	24*	11 47 51.1	15 56 42.0	Em.
	26	6 16 29.7	10 32 19.2	Em.
	28	0 45 10.2	5 7 58.5	Em.
	29	19 13 49.6	23 43 36.5	Em.
	31	13 42 32.1	18 19 17.7	Em.
II.	3*	9 9 23.7	11 55 0.9	Em.
	6	22 27 26.6	1 27 4.6	Em.
	10*	11 46 31.6	15 0 10.5	Em.
	14	1 4 34.9	4 32 14.5	Em.
	17	14 23 37.9	18 5 18.5	Em.
	21	3 41 40.5	7 37 21.8	Em.
	24	17 0 40.1	21 10 22.3	Em.
	28	6 18 41.7	10 42 24.7	Em.
	31	19 37 36.8	0 15 20.7	Em.
III.	5	6 37 25.0	9 30 30.3	Im.
	5*	9 45 29.8	12 39 6.0	Em.
	12*	10 36 35.4	13 57 55.9	Im.
	12†	13 43 55.1	17 5 46.3	Em.
	19	14 35 46.6	18 25 22.3	Im.
	19	17 42 21.4	21 32 27.8	Em.
	26	18 35 35.0	22 53 25.9	Im.
	26	21 41 23.9	1 59 45.4	Em.
IV.	14	22 18 32.6	1 49 41.5	Im.
	15	1 19 0.8	4 50 39.4	Em.
	31	16 21 47.6	20 58 59.4	Im.
	31	19 13 12.3	23 50 52.2	Em.



APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHADOWS.	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Egress.
	d h m	d h m	d h m	d h m	d h m	d h m
I.	1* 10 54		2 8 14	2† 10 32	2 9 19	2* 11
	3 5 28		4 2 48	4 5 7	4 3 55	4 6
	4 0 3		5 21 23	5 23 41	5 22 30	5 0
	6 18 37		7* 15 58	7 18 16	7† 17 6	7 19
	8* 13 12		9 10 32	9* 12 51	9* 11 42	9* 14
	10 7 47	In	11 5 7	11 7 25	11 6 18	11 8
	11 2 21		12 23 42	12 2 0	12 0 53	12 3
	13 20 56		14 18 17	14 20 35	14 19 29	14 21
	15* 15 31		16* 12 52	16* 15 10	16* 14 5	16* 16
	17 10 6	the	18 7 27	18 9 46	18 8 41	18 10
	19 4 41		19 2 2	20 4 21	19 3 16	20 5
	20 23 16		21 20 37	21 22 56	21 21 52	21 0
	22 17 51		23* 15 13	23† 17 31	23* 16 28	23 18
	24† 12 26	Shadow.	25 9 48	25 12 7	25 11 4	25* 13
	26 7 2		27 4 24	27 6 42	27 5 40	27 7
	27 1 37		28 22 59	28 1 17	28 0 15	28 2
	29 20 12		30† 17 35	30 19 53	30 18 51	30 21
	31* 14 48					
II.	3 6 53		1* 11 57	1* 14 47	1* 14 9	1† 16
	6 20 21	In	4 1 23	5 4 13	5 3 40	5 6
	10 9 50		8* 14 50	8† 17 41	8† 17 11	8 20
	13 23 19		12 4 18	12 7 8	12 6 43	12 9
	17* 12 49	the	15 17 46	15 20 37	15 20 14	15 23
	20 2 19		19 7 15	19 10 5	19 9 46	19† 12
	24* 15 50		22 20 44	22 23 35	22 23 17	22 2
	28 5 21	Shadow.	26 10 14	26† 13 5	26† 12 49	26* 15
	31 18 53		29 23 44	29 2 35	29 2 20	30 5
III.	5 4 52	5 8 17	1* 14 43	1 18 8	1 19 5	1 22
	12 9 3	12* 12 28	8 18 52	8 22 17	8 23 33	8 2
	19* 13 18	19* 16 44	15 23 5	15 2 31	16 4 1	16 7
	26† 17 37	26 21 4	22 3 22	23 6 49	23 8 28	23 11
			30 7 44	30 11 11	30† 12 56	30* 16
IV.	14* 14 8	14 31		7 25	6* 14 19	6† 17
	31 8 29	31		7 4	23 9 28	23† 12

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>h</sup> .629573. Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	-1.1490	-1.1288	+8.8990	+0.8455	21 20 15.87	39	120	.329
2	1.1425	1.1371	8.9120	0.8463	21 16 19.96	40	121	.331
3	1.1357	1.1450	8.9247	0.8471	21 12 24.05	41	122	.334
4	-1.1287	-1.1527	+8.9371	+0.8478	21 8 28.14	42	123	.337
5	1.1215	1.1602	8.9494	0.8486	21 4 32.24	43	124	.339
6	1.1140	1.1673	8.9615	0.8494	21 0 36.33	44	125	.342
7	-1.1063	-1.1743	+8.9735	+0.8502	20 56 40.42	45	126	.345
8	1.0983	1.1810	8.9852	0.8510	20 52 44.51	46	127	.348
9	1.0900	1.1875	8.9967	0.8517	20 48 48.60	47	128	.350
10	-1.0815	-1.1938	+9.0080	+0.8525	20 44 52.69	48	129	.353
11	1.0726	1.1998	9.0192	0.8532	20 40 56.78	49	130	.356
12	1.0635	1.2057	9.0302	0.8540	20 37 0.87	50	131	.359
13	-1.0540	-1.2113	+9.0410	+0.8547	20 33 4.96	51	132	.361
14	1.0442	1.2168	9.0517	0.8554	20 29 9.05	52	133	.364
15	1.0341	1.2220	9.0622	0.8561	20 25 13.14	53	134	.367
16	-1.0236	-1.2271	+9.0726	+0.8568	20 21 17.24	54	135	.370
17	1.0127	1.2320	9.0828	0.8575	20 17 21.33	55	136	.372
18	1.0014	1.2367	9.0929	0.8581	20 13 25.42	56	137	.375
19	-0.9897	-1.2412	+9.1028	+0.8588	20 9 29.51	57	138	.378
20	0.9775	1.2456	9.1126	0.8594	20 5 33.60	58	139	.381
21	0.9649	1.2498	9.1223	0.8600	20 1 37.69	59	140	.383
22	-0.9518	-1.2538	+9.1318	+0.8606	19 57 41.78	60	141	.386
23	0.9381	1.2577	9.1412	0.8611	19 53 45.87	61	142	.389
24	0.9239	1.2614	9.1505	0.8616	19 49 49.96	62	143	.392
25	-0.9091	-1.2650	+9.1596	+0.8622	19 45 54.05	63	144	.394
26	0.8936	1.2684	9.1687	0.8627	19 41 58.14	64	145	.397
27	0.8775	1.2717	9.1776	0.8631	19 38 2.23	65	146	.400
28	-0.8606	-1.2748	+9.1863	+0.8636	19 34 6.31	66	147	.402
29	0.8428	1.2778	9.1950	0.8640	19 30 10.40	67	148	.405
30	0.8243	1.2806	9.2036	0.8644	19 26 14.49	68	149	.408
31	0.8047	1.2833	9.2120	0.8647	19 22 18.58	69	150	.411
2	-0.7841	-1.2859	+9.2203	+0.8651	19 18 22.67	70	151	.413



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be subd. from added to Apparent Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>
Sat.	1	4 35 52.01	10.234	N. 22 2 53.5	20.04	1 8.32	2 34.60
Sun.	2	4 39 57.63	10.251	22 10 54.4	19.07	1 8.38	2 25.56
Mon.	3	4 44 3.66	10.268	22 18 32.1	18.10	1 8.43	2 16.11
Tues.	4	4 48 10.09	10.283	22 25 46.6	17.12	1 8.48	2 6.27
Wed.	5	4 52 16.89	10.298	22 32 37.6	16.14	1 8.53	1 56.06
Thur.	6	4 56 24.04	10.312	22 39 5.0	15.15	1 8.57	1 45.49
Frid.	7	5 0 31.53	10.325	22 45 8.6	14.16	1 8.61	1 34.59
Sat.	8	5 4 39.33	10.337	22 50 48.4	13.16	1 8.65	1 23.38
Sun.	9	5 8 47.41	10.347	22 56 4.1	12.15	1 8.69	1 11.89
Mon.	10	5 12 55.74	10.357	23 0 55.7	11.14	1 8.73	1 0.14
Tues.	11	5 17 4.31	10.366	23 5 23.0	10.12	1 8.76	0 48.16
Wed.	12	5 21 13.09	10.373	23 9 25.9	9.10	1 8.79	0 35.97
Thur.	13	5 25 22.05	10.380	23 13 4.4	8.08	1 8.82	0 23.60
Frid.	14	5 29 31.17	10.385	23 16 18.4	7.05	1 8.84	0 11.08
Sat.	15	5 33 40.41	10.390	23 19 7.7	6.03	1 8.86	0 1.57
Sun.	16	5 37 49.76	10.393	23 21 32.3	5.00	1 8.87	0 14.33
Mon.	17	5 41 59.19	10.395	23 23 32.2	3.96	1 8.88	0 27.17
Tues.	18	5 46 8.67	10.397	23 25 7.3	2.93	1 8.89	0 40.06
Wed.	19	5 50 18.19	10.397	23 26 17.5	1.90	1 8.90	0 52.98
Thur.	20	5 54 27.72	10.397	23 27 3.0	0.86	1 8.90	1 5.92
Frid.	21	5 58 37.24	10.395	23 27 23.7	0.18	1 8.90	1 18.85
Sat.	22	6 2 46.73	10.393	23 27 19.5	1.21	1 8.90	1 31.75
Sun.	23	6 6 56.17	10.390	23 26 50.5	2.24	1 8.89	1 44.60
Mon.	24	6 11 5.54	10.387	23 25 56.7	3.27	1 8.88	1 57.37
Tues.	25	6 15 14.82	10.382	23 24 38.1	4.30	1 8.87	2 10.06
Wed.	26	6 19 23.99	10.377	23 22 54.8	5.33	1 8.85	2 22.63
Thur.	27	6 23 33.03	10.371	23 20 46.9	6.35	1 8.83	2 35.08
Frid.	28	6 27 41.92	10.364	23 18 14.4	7.38	1 8.81	2 47.38
Sat.	29	6 31 50.65	10.356	23 15 17.3	8.40	1 8.78	2 59.52
Sun.	30	6 35 59.19	10.347	23 11 55.8	9.41	1 8.75	3 11.47
Mon.	31	6 40 7.52		N. 21		8.72	3 23.22

\* Mean Time of the Semidiameter pa

## AT MEAN NOON.

	Day of the Month.	THE SUN'S			Equation of Time, to be added to subt. from Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
	1	4 35 52.45	N. 22 2 54.4	15 47.2	2 34.59	4 38 27.04
n.	2	4 39 58.05	22 10 55.2	15 47.1	2 25.55	4 42 23.59
n.	3	4 44 4.05	22 18 32.8	15 46.9	2 16.10	4 46 20.15
es.	4	4 48 10.45	22 25 47.2	15 46.8	2 6.25	4 50 16.71
ed.	5	4 52 17.22	22 32 38.1	15 46.7	1 56.04	4 54 13.26
ur.	6	4 56 24.35	22 39 5.4	15 46.6	1 45.48	4 58 9.82
d.	7	5 0 31.80	22 45 9.0	15 46.4	1 34.58	5 2 6.38
t.	8	5 4 39.57	22 50 48.7	15 46.3	1 23.37	5 6 2.94
n.	9	5 8 47.62	22 56 4.4	15 46.2	1 11.88	5 9 59.49
on.	10	5 12 55.92	23 0 55.9	15 46.1	1 0.13	5 13 56.05
es.	11	5 17 4.45	23 5 23.2	15 46.0	0 48.15	5 17 52.61
ed.	12	5 21 13.19	23 9 26.1	15 45.9	0 35.97	5 21 49.16
ur.	13	5 25 22.12	23 13 4.5	15 45.9	0 23.60	5 25 45.72
id.	14	5 29 31.20	23 16 18.4	15 45.8	0 11.08	5 29 42.28
t.	15	5 33 40.41	23 19 7.7	15 45.7	0 1.57	5 33 38.83
n.	16	5 37 49.72	23 21 32.3	15 45.6	0 14.32	5 37 35.39
on.	17	5 41 59.11	23 23 32.1	15 45.6	0 27.16	5 41 31.95
es.	18	5 46 8.56	23 25 7.2	15 45.5	0 40.05	5 45 28.51
ed.	19	5 50 18.04	23 26 17.5	15 45.5	0 52.97	5 49 25.06
ur.	20	5 54 27.53	23 27 3.0	15 45.4	1 5.91	5 53 21.62
id.	21	5 58 37.02	23 27 23.7	15 45.4	1 18.84	5 57 18.18
t.	22	6 2 46.47	23 27 19.5	15 45.3	1 31.73	6 1 14.74
n.	23	6 6 55.87	23 26 50.5	15 45.3	1 44.58	6 5 11.29
on.	24	6 11 5.20	23 25 56.8	15 45.3	1 57.36	6 9 7.85
es.	25	6 15 14.44	23 24 38.3	15 45.2	2 10.04	6 13 4.41
ed.	26	6 19 23.57	23 22 55.1	15 45.2	2 22.61	6 17 0.96
ur.	27	6 23 32.58	23 20 47.2	15 45.2	2 35.06	6 20 57.52
id.	28	6 27 41.44	23 18 14.7	15 45.1	2 47.36	6 24 54.08
t.	29	6 31 50.13	23 15 17.7	15 45.1	2 59.50	6 28 50.63
on.	30	6 35 58.64	23 11 56.3	15 45.1	3 11.45	6 32 47.19
on.	31	6 40 6.94	N. 23 8 10.5	15 45.1	3 23.19	6 36 43.75

[Diameter for Apparent Noon may be assumed the same as that for Mean Noon.]



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Par.	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Mid.
1	70° 34' 16" 5	N. 0° 01'	0.0062420	14 48' 5"	14 51' 1"	54 20' 5"	54 1
2	71 31 43 1	S. 0° 12'	0.0063050	14 54' 4"	14 58' 3"	54 42' 1"	54 3
3	72 29 9 0	0° 24'	0.0063662	15 2' 9"	15 8' 2"	55 13' 5"	55 3
4	73 26 34 4	0° 34'	0.0064256	15 14' 1"	15 20' 4"	55 54' 3"	56 1
5	74 23 59 1	0° 42'	0.0064829	15 27' 2"	15 34' 3"	56 42' 5"	57 1
6	75 21 23 2	0° 48'	0.0065379	15 41' 7"	15 49' 2"	57 35' 7"	58 1
7	76 18 46 7	0° 50'	0.0065906	15 56' 5"	16 3' 7"	58 30' 2"	58 8
8	77 16 9 6	0° 50'	0.0066408	16 10' 5"	16 16' 6"	59 21' 3"	59 4
9	78 13 31 8	0° 47'	0.0066886	16 21' 9"	16 26' 4"	60 3' 4"	60 11
10	79 10 53 2	0° 40'	0.0067339	16 29' 8"	16 32' 2"	60 32' 4"	60 4
11	80 8 13 9	0° 31'	0.0067767	16 33' 5"	16 33' 5"	60 45' 8"	60 4
12	81 5 33 9	0° 21'	0.0068169	16 32' 5"	16 30' 5"	60 42' 3"	60 3
13	82 2 53 1	S. 0° 08'	0.0068547	16 27' 5"	16 23' 6"	60 23' 7"	60 1
14	83 0 11 5	N. 0° 06'	0.0068901	16 19' 0"	16 14' 0"	59 52' 8"	59 3
15	83 57 29 0	0° 19'	0.0069232	16 8' 6"	16 2' 8"	59 14' 4"	58 3
16	84 54 45 7	0° 31'	0.0069541	15 56' 9"	15 51' 1"	58 31' 7"	58 1
17	85 52 1 7	0° 42'	0.0069828	15 45' 3"	15 39' 6"	57 48' 8"	57 2
18	86 49 16 8	0° 51'	0.0070096	15 34' 1"	15 28' 7"	57 7' 7"	56 4
19	87 46 31 2	0° 58'	0.0070345	15 23' 6"	15 18' 8"	56 29' 4"	56 1
20	88 43 45 0	0° 63'	0.0070576	15 14' 2"	15 10' 0"	55 55' 0"	55 3
21	89 40 58 1	0° 63'	0.0070791	15 6' 0"	15 2' 3"	55 24' 7"	55 1
22	90 38 10 7	0° 61'	0.0070990	14 58' 9"	14 55' 8"	54 58' 6"	54 4
23	91 35 22 9	0° 57'	0.0071175	14 52' 9"	14 50' 3"	54 36' 7"	54 2
24	92 32 34 6	0° 49'	0.0071346	14 48' 1"	14 46' 2"	54 19' 1"	54 1
25	93 29 46 0	0° 39'	0.0071502	14 44' 7"	14 43' 5"	54 6' 5"	54 1
26	94 26 57 3	0° 27'	0.0071643	14 42' 8"	14 42' 4"	53 59' 6"	53 3
27	95 24 8 5	0° 14'	0.0071770	14 42' 5"	14 43' 0"	53 58' 6"	54 1
28	96 21 19 6	N. 0° 01'	0.0071882	14 44' 1"	14 45' 6"	54 4' 3"	54 1
29	97 18 30 9	S. 0° 13'	0.0071977	14 47' 7"	14 50' 4"	54 17' 6"	54 2
30	98 15 42 3	0° 25'	0.0072056	14 53' 6"	14 57' 4"	54 39' 2"	54 3
31	99 12 53 9	S. 0° 36'	0.0072116		6' 9"	55 9' 7"	55 2

## MEAN TIME.

		THE MOON'S																				
		Longitude.						Latitude.						Age.		Meridian						
		Noon.			Midnight.			Noon.			Midnight.			Noon.	Passage.							
Day of the Month.		<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>d</sup> <sup>m</sup> <sup>s</sup>	<sup>d</sup> <sup>m</sup> <sup>s</sup>							
t.	1	322	16	36	8	328	13	26	5	S. 0	28	42	8	S. 1	0	10	5	20	5	17	32	6
n.	2	334	12	36	2	340	14	46	0	1	31	11	7	2	1	27	7	21	5	18	17	1
n.	3	346	20	36	3	352	30	46	0	2	30	38	9	2	58	25	6	22	5	19	1	6
es.	4	358	45	53	1	5	6	31	8	3	24	26	3	3	48	18	8	23	5	19	46	9
d.	5	11	33	13	2	18	6	22	0	4	9	40	3	4	28	6	9	24	5	20	33	9
ar.	6	24	46	16	8	31	33	7	4	4	43	15	4	4	54	41	8	25	5	21	23	4
d.	7	38	26	55	2	45	27	30	0	5	2	5	0	5	5	5	2	26	5	22	16	1
.	8	52	34	31	1	59	47	26	1	5	3	27	0	4	56	59	3	27	5	23	12	5
t.	9	67	5	32	0	74	27	56	0	4	45	38	1	4	29	25	4	28	5		6	
n.	10	81	53	38	4	89	21	33	0	4	8	32	2	3	43	17	3	0	2	0	12	3
es.	11	96	50	31	5	104	19	27	5	3	14	6	4	2	41	32	8	1	2	1	14	3
d.	12	111	47	16	8	119	13	1	8	2	6	15	0	1	28	55	4	2	2	2	16	6
ar.	13	126	35	52	0	133	55	6	2	S. 0	50	17	5	S. 0	11	6	4	3	2	3	17	1
d.	14	141	10	12	4	148	20	47	5	N. 0	27	55	7	N. 1	6	8	6	4	2	4	14	7
.	15	155	26	37	1	162	27	34	2	1	42	55	2	2	17	43	1	5	2	5	8	9
t.	16	169	23	37	8	176	14	52	0	2	50	4	6	3	19	35	8	6	2	6	0	0
n.	17	183	1	24	4	189	43	26	2	3	45	56	7	4	8	53	2	7	2	6	48	8
es.	18	196	21	9	4	202	54	47	2	4	28	12	8	4	43	47	6	8	2	7	36	1
d.	19	209	24	33	2	215	50	40	7	4	55	32	4	5	3	26	2	9	2	8	22	7
ar.	20	222	13	22	2	228	32	49	7	5	7	28	5	5	7	42	3	10	2	9	9	4
d.	21	234	49	14	3	241	2	45	7	5	4	12	9	4	57	8	1	11	2	9	56	6
.	22	247	13	33	9	253	21	48	0	4	46	36	9	4	32	50	4	12	2	10	44	5
ar.	23	259	27	36	8	265	31	9	5	4	16	0	7	3	56	22	4	13	2	11	33	0
n.	24	271	32	36	6	277	32	8	8	3	34	11	1	3	9	42	2	14	2	12	21	7
es.	25	283	29	58	7	289	26	20	0	2	43	13	1	2	15	1	7	15	2	13	10	0
d.	26	295	21	29	1	301	15	43	8	1	45	25	7	1	14	44	1	16	2	13	57	6
ar.	27	307	9	24	6	313	2	54	6	N. 0	43	14	6	N. 0	11	15	8	17	2	14	44	0
d.	28	318	56	38	7	324	51	4	4	S. 0	20	53	4	S. 0	52	54	7	18	2	15	29	2
.	29	330	46	41	2	336	44	0	5	1	24	29	8	1	55	19	9	19	2	16	13	5
es.	30	342	43	35	9	348	46	2	2	2	25	7	1	2	53	31	8	20	2	16	57	3
n.	31	354	51	54	7	1	1	48	6	S. 3	20	14	5	S. 3	44	56	4	21	2	17	41	2



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.
SATURDAY 1.				MONDAY 3.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	21 39 12.16	S. 14 32 55.5	71.90	0	23 13 40.50	S. 7 42 19.4
1	21 41 11.55	14 25 44.1	72.57	1	23 15 38.08	7 32 32.2
2	21 43 10.85	14 18 28.7	73.20	2	23 17 35.68	7 22 42.6
3	21 45 10.07	14 11 9.5	73.85	3	23 19 33.30	7 12 50.4
4	21 47 9.22	14 3 46.4	74.48	4	23 21 30.95	7 2 55.8
5	21 49 8.28	13 56 19.5	75.08	5	23 23 28.63	6 52 58.8
6	21 51 7.27	13 48 48.7	75.75	6	23 25 26.34	6 42 59.4
7	21 53 6.18	13 41 14.2	76.37	7	23 27 24.08	6 32 57.7
8	21 55 5.02	13 33 36.0	77.00	8	23 29 21.87	6 22 53.6
9	21 57 3.78	13 25 54.0	77.60	9	23 31 19.69	6 12 47.3
10	21 59 2.48	13 18 8.4	78.22	10	23 33 17.56	6 2 38.7
11	22 1 1.11	13 10 19.1	78.83	11	23 35 15.47	5 52 27.9
12	22 2 59.67	13 2 26.1	79.42	12	23 37 13.43	5 42 14.9
13	22 4 58.17	12 54 29.6	80.03	13	23 39 11.44	5 31 59.7
14	22 6 56.60	12 46 29.4	80.60	14	23 41 9.52	5 21 42.5
15	22 8 54.97	12 38 25.8	81.20	15	23 43 7.65	5 11 23.1
16	22 10 53.28	12 30 18.6	81.78	16	23 45 5.84	5 1 17.7
17	22 12 51.54	12 22 7.9	82.37	17	23 47 4.10	4 50 38.4
18	22 14 49.74	12 13 53.7	82.93	18	23 49 2.42	4 40 13.0
19	22 16 47.88	12 5 36.1	83.50	19	23 51 0.82	4 29 45.7
20	22 18 45.98	11 57 15.1	84.07	20	23 52 59.29	4 19 16.5
21	22 20 44.02	11 48 50.7	84.62	21	23 54 57.83	4 8 45.4
22	22 22 42.02	11 40 23.0	85.18	22	23 56 56.46	3 58 12.6
23	22 24 39.97	S. 11 31 51.9	85.73	23	23 58 55.17	S. 3 47 37.9
SUNDAY 2.				TUESDAY 4.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	22 26 37.88	S. 11 23 17.5	86.27	0	0 0 53.97	S. 3 37 1.5
1	22 28 35.75	11 14 39.9	86.82	1	0 2 52.86	3 26 23.4
2	22 30 33.57	11 5 59.0	87.35	2	0 4 51.84	3 15 43.6
3	22 32 31.36	10 57 14.9	87.88	3	0 6 50.91	3 5 2.2
4	22 34 29.12	10 48 27.6	88.40	4	0 8 50.08	2 54 19.2
5	22 36 26.84	10 39 37.2	88.93	5	0 10 49.36	2 43 34.7
6	22 38 24.53	10 30 43.6	89.43	6	0 12 48.75	2 32 48.7
7	22 40 22.19	10 21 47.0	89.97	7	0 14 48.24	2 22 1.1
8	22 42 19.83	10 12 47.2	90.45	8	0 16 47.85	2 11 12.2
9	22 44 17.44	10 3 44.5	90.97	9	0 18 47.57	2 0 21.8
10	22 46 15.04	9 54 38.7	91.45	10	0 20 47.41	1 49 30.2
11	22 48 12.61	9 45 30.0	91.95	11	0 22 47.38	1 38 37.2
12	22 50 10.17	9 36 18.3	92.43	12	0 24 47.47	1 27 42.9
13	22 52 7.71	9 27 3.7	92.92	13	0 26 47.69	1 16 47.4
14	22 54 5.24	9 17 46.2	93.38	14	0 28 48.05	1 5 50.8
15	22 56 2.77	9 8 25.9	93.87	15	0 30 48.54	0 54 53.0
16	22 58 0.28	8 59 2.7	94.33	16	0 32 49.16	0 43 54.1
17	22 59 57.79	8 49 36.7	94.78	17	0 34 49.94	0 32 54.1
18	23 1 55.31	8 40 8.0	95.25	18	0 36 50.86	0 21 53.2
19	23 3 52.82	8 30 36.5	95.68	19	0 38	0 10 51.3
20	23 5 50.34	8 21 2.4	96.13	20	0 40	
21	23 7 47.86	8 11 25.6	96.58	21	0	
22	23 9 45.39	8 1 46.1	97.02	22		
23	23 11 42.94	7 52 4.0	97.43			
24	23 13 40.50	S. 7 42 19.4				



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
WEDNESDAY 5.				FRIDAY 7.		
h m s	° ' "	"		h m s	° ' "	"
0 48 59.63	N. 0 44 31.0	111.12	0	2 30 50.16	N. 9 33 30.7	105.15
0 51 1.67	0 55 37.7	111.22	1	2 33 4.17	9 44 1.6	104.75
0 53 3.88	1 6 45.0	111.32	2	2 35 18.49	9 54 30.1	104.33
0 55 6.27	1 17 52.9	111.42	3	2 37 33.13	10 4 56.1	103.92
0 57 8.83	1 29 1.4	111.48	4	2 39 48.10	10 15 19.6	103.45
0 59 11.58	1 40 10.3	111.55	5	2 42 3.39	10 25 40.3	103.02
1 1 14.52	1 51 19.6	111.62	6	2 44 19.01	10 35 58.4	102.53
1 3 17.65	2 2 29.3	111.67	7	2 46 34.96	10 46 13.6	102.05
1 5 20.97	2 13 39.3	111.72	8	2 48 51.23	10 56 25.9	101.57
1 7 24.49	2 24 49.6	111.75	9	2 51 7.84	11 6 35.3	101.05
1 9 28.21	2 36 0.1	111.77	10	2 53 24.79	11 16 41.6	100.52
1 11 32.13	2 47 10.7	111.80	11	2 55 42.07	11 26 44.7	99.98
1 13 36.26	2 58 21.5	111.80	12	2 57 59.68	11 36 44.6	99.43
1 15 40.60	3 9 32.3	111.78	13	3 0 17.64	11 46 41.2	98.87
1 17 45.16	3 20 43.0	111.78	14	3 2 35.93	11 56 34.4	98.30
1 19 49.93	3 31 53.7	111.77	15	3 4 54.56	12 6 24.2	97.68
1 21 54.93	3 43 4.3	111.73	16	3 7 13.54	12 16 10.3	97.10
1 24 0.14	3 54 14.7	111.70	17	3 9 32.86	12 25 52.9	96.47
1 26 5.59	4 5 24.9	111.65	18	3 11 52.53	12 35 31.7	95.82
1 28 11.27	4 16 34.8	111.58	19	3 14 12.53	12 45 6.6	95.18
1 30 17.18	4 27 44.3	111.52	20	3 16 32.89	12 54 37.7	94.52
1 32 23.32	4 38 53.4	111.43	21	3 18 53.59	13 4 4.8	93.83
1 34 29.71	4 50 2.0	111.37	22	3 21 14.64	13 13 27.8	93.15
1 36 36.33	N. 5 1 10.2	111.25	23	3 23 36.03	N. 13 22 46.7	92.43
THURSDAY 6.				SATURDAY 8.		
h m s	° ' "	"		h m s	° ' "	"
1 38 43.21	N. 5 12 17.7	111.15	0	3 25 57.77	N. 13 32 1.3	91.72
1 40 50.34	5 23 24.6	111.02	1	3 28 19.86	13 41 11.6	90.97
1 42 57.72	5 34 30.7	110.90	2	3 30 42.30	13 50 17.4	90.23
1 45 5.35	5 45 36.1	110.77	3	3 33 5.08	13 59 18.8	89.47
1 47 13.24	5 56 40.7	110.60	4	3 35 28.21	14 8 15.6	88.67
1 49 21.40	6 7 44.3	110.45	5	3 37 51.69	14 17 7.6	87.88
1 51 29.82	6 18 47.0	110.27	6	3 40 15.52	14 25 54.9	87.07
1 53 38.52	6 29 48.6	110.10	7	3 42 39.69	14 34 37.3	86.25
1 55 47.48	6 40 49.2	109.88	8	3 45 4.21	14 43 14.8	85.42
1 57 56.72	6 51 48.5	109.70	9	3 47 29.08	14 51 47.3	84.55
2 0 6.23	7 2 46.7	109.47	10	3 49 54.29	15 0 14.6	83.67
2 2 16.03	7 13 43.5	109.23	11	3 52 19.84	15 8 36.7	82.80
2 4 26.11	7 24 38.9	109.00	12	3 54 45.74	15 16 53.5	81.90
2 6 36.48	7 35 32.9	108.75	13	3 57 11.98	15 25 4.9	81.00
2 8 47.13	7 46 25.4	108.48	14	3 59 38.56	15 33 10.9	80.07
2 10 58.08	7 57 16.3	108.20	15	4 2 5.48	15 41 11.3	79.12
2 13 9.32	8 8 5.5	107.92	16	4 4 32.73	15 49 6.0	78.17
2 15 20.86	8 18 53.0	107.62	17	4 7 0.32	15 56 55.0	77.20
2 17 32.70	8 29 38.7	107.30	18	4 9 28.24	16 4 38.2	76.22
2 19 44.84	8 40 22.5	106.98	19	4 11 56.50	16 12 15.5	75.20
2 21 57.28	8 51 4.4	106.63	20	4 14 25.08	16 19 46.7	74.20
2 23 57.4	9 1 44.2	106.28	21	4 16 54.00	16 27 11.9	73.18
2 25 57.4	12 21.9	105.92	22	4 19 23.23	16 34 31.0	72.13
2 27 57.4	12 57.4	105.55	23	4 21 52.79	16 41 43.8	71.08
2 29 57.4	30.7		24	4 24 22.67	N. 16 48 50.3	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
SUNDAY 9.				TUESDAY 11.		
0	4 24 22.67	N.16 48 50.3	70.02	0	6 29 5.79	N.20 2 56.3
1	4 26 52.87	16 55 50.4	68.93	1	6 31 45.28	20 3 33.3
2	4 29 23.37	17 2 44.0	67.83	2	6 34 24.79	20 4 1.3
3	4 31 54.19	17 9 31.0	66.72	3	6 37 4.32	20 4 20.4
4	4 34 25.32	17 16 11.3	65.62	4	6 39 43.87	20 4 30.7
5	4 36 56.75	17 22 45.0	64.47	5	6 42 23.42	20 4 32.0
6	4 39 28.48	17 29 11.8	63.32	6	6 45 2.96	20 4 24.4
7	4 42 0.51	17 35 31.7	62.17	7	6 47 42.49	20 4 7.8
8	4 44 32.83	17 41 44.7	60.98	8	6 50 22.01	20 3 42.4
9	4 47 5.43	17 47 50.6	59.80	9	6 53 1.50	20 3 8.0
10	4 49 38.33	17 53 49.4	58.60	10	6 55 40.95	20 2 24.7
11	4 52 11.50	17 59 41.0	57.40	11	6 58 20.37	20 1 32.5
12	4 54 44.95	18 5 25.4	56.17	12	7 0 59.73	20 0 31.4
13	4 57 18.67	18 11 2.4	54.93	13	7 3 39.04	19 59 21.4
14	4 59 52.66	18 16 32.0	53.70	14	7 6 18.28	19 58 2.6
15	5 2 26.92	18 21 54.2	52.42	15	7 8 57.44	19 56 34.9
16	5 5 1.43	18 27 8.7	51.17	16	7 11 36.53	19 54 58.4
17	5 7 36.19	18 32 15.7	49.88	17	7 14 15.53	19 53 13.2
18	5 10 11.20	18 37 15.0	48.58	18	7 16 54.43	19 51 19.1
19	5 12 46.45	18 42 6.5	47.30	19	7 19 33.24	19 49 16.3
20	5 15 21.94	18 46 50.3	45.97	20	7 22 11.93	19 47 4.8
21	5 17 57.66	18 51 26.1	44.67	21	7 24 50.51	19 44 44.6
22	5 20 33.60	18 55 54.1	43.32	22	7 27 28.96	19 42 15.8
23	5 23 9.77	N.19 0 14.0	41.98	23	7 30 7.29	N.19 39 38.3
MONDAY 10.				WEDNESDAY 12.		
0	5 25 46.14	N.19 4 25.9	40.63	0	7 32 45.47	N.19 36 52.2
1	5 28 22.73	19 8 29.7	39.27	1	7 35 23.51	19 33 57.6
2	5 30 59.51	19 12 25.3	37.90	2	7 38 1.40	19 30 54.4
3	5 33 36.49	19 16 12.7	36.52	3	7 40 39.14	19 27 42.8
4	5 36 13.65	19 19 51.8	35.15	4	7 43 16.71	19 24 22.8
5	5 38 51.00	19 23 22.7	33.73	5	7 45 54.11	19 20 54.4
6	5 41 28.52	19 26 45.1	32.35	6	7 48 31.34	19 17 17.7
7	5 44 6.21	19 29 59.2	30.93	7	7 51 8.38	19 13 32.7
8	5 46 44.07	19 33 4.8	29.52	8	7 53 45.23	19 9 39.4
9	5 49 22.07	19 36 1.9	28.10	9	7 56 21.89	19 5 38.0
10	5 52 0.23	19 38 50.5	26.67	10	7 58 58.35	19 1 28.4
11	5 54 38.52	19 41 30.5	25.23	11	8 1 34.60	18 57 10.7
12	5 57 16.95	19 44 1.9	23.78	12	8 4 10.64	18 52 45.0
13	5 59 55.50	19 46 24.6	22.35	13	8 6 46.46	18 48 11.3
14	6 2 34.18	19 48 38.7	20.88	14	8 9 22.06	18 43 29.7
15	6 5 12.96	19 50 44.0	19.45	15	8 11 57.43	18 38 40.3
16	6 7 51.85	19 52 40.7	17.97	16	8 14 32.57	18 33 43.1
17	6 10 30.83	19 54 28.5	16.52	17	8 17 7.47	18 28 28.1
18	6 13 9.90	19 56 7.6	15.03	18		
19	6 15 49.05	19 57 37.8	13.57	19		
20	6 18 28.28	19 58 59.2	12.10			
21	6 21 7.58	20 0 11.8	10.62			
22	6 23 46.93	20 1 15.5	9.13			
23	6 26 26.34	20 2 10.3	7.65			
24	6 29 5.79	N.20 2 56.2				



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 13.				SATURDAY 15.		
h m s N. 17 49 32.5	60.73		0	h m s N. 11 7 1.3	102.62	
8 35 4.73	61.92		1	10 31 36.10	103.17	
8 37 37.57	63.10		2	10 33 54.07	103.68	
8 40 10.13	64.27		3	10 36 11.74	104.20	
8 42 42.42	65.40		4	10 38 29.11	104.68	
8 45 14.42	66.53		5	10 40 46.19	105.18	
8 47 46.14	67.67		6	10 43 2.97	105.65	
8 50 17.57	68.78		7	10 45 19.46	106.12	
8 52 48.70	69.87		8	10 47 35.66	106.57	
8 55 19.54	70.97		9	10 49 51.58	107.00	
8 57 50.08	72.03		10	10 52 7.21	107.42	
9 0 20.33	73.08		11	10 54 22.56	107.82	
9 2 50.27	74.13		12	10 56 37.63	108.22	
9 5 19.91	75.17		13	10 58 52.43	108.60	
9 7 49.24	76.18		14	11 1 6.95	108.98	
9 10 18.26	77.18		15	11 3 21.20	109.33	
9 12 46.97	78.18		16	11 5 35.18	109.68	
9 15 15.37	79.15		17	11 7 48.90	110.02	
9 17 43.46	80.12		18	11 10 2.35	110.35	
9 20 11.23	81.07		19	11 12 15.54	110.65	
9 22 38.69	82.02		20	11 14 28.47	110.95	
9 25 5.83	82.92		21	11 16 41.14	111.25	
9 27 32.65	83.85		22	11 18 53.57	111.52	
9 29 59.15	84.73		23	11 21 5.74	111.78	
9 32 25.34				11 23 17.67		
FRIDAY 14.				SUNDAY 16.		
9 34 51.20	85.62		0	11 25 29.36	112.03	
9 37 16.74	86.48		1	11 27 40.81	112.28	
9 39 41.96	87.33		2	11 29 52.02	112.52	
9 42 6.86	88.18		3	11 32 3.00	112.73	
9 44 31.44	89.00		4	11 34 13.74	112.93	
9 46 55.70	89.82		5	11 36 24.26	113.13	
9 49 19.63	90.62		6	11 38 34.55	113.32	
9 51 43.24	91.40		7	11 40 44.63	113.50	
9 54 6.53	92.17		8	11 42 54.48	113.65	
9 56 29.50	92.92		9	11 45 4.12	113.82	
9 58 52.15	93.67		10	11 47 13.55	113.95	
10 1 14.48	94.40		11	11 49 22.77	114.08	
10 3 36.49	95.12		12	11 51 31.78	114.20	
10 5 58.18	95.80		13	11 53 40.59	114.32	
10 8 19.55	96.50		14	11 55 49.20	114.42	
10 10 40.61	97.17		15	11 57 57.62	114.50	
10 13 1.35	97.83		16	12 0 5.84	114.58	
10 15 21.78	98.47		17	12 2 13.88	114.65	
17 41.89	99.12		18	12 4 21.73	114.72	
1.70	99.72		19	12 6 29.40	114.75	
1.19	100.33		20	12 8 36.89	114.80	
2.8	100.93		21	12 10 44.21	114.82	
	101.50		22	12 12 51.36	114.85	
	102.07		23	12 14 58.34	114.85	
			24	12 17 5.15		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
MONDAY 17.				WEDNESDAY 19.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	12 17 5.15	N. 2 15 8.3	114.85	0	13 56 22.81	S. 6 39 35.3
1	12 19 11.80	2 3 39.2	114.83	1	13 58 25.50	6 50 2.7
2	12 21 18.30	1 52 10.2	114.82	2	14 0 28.17	7 0 27.6
3	12 23 24.65	1 40 41.3	114.80	3	14 2 30.84	7 10 50.0
4	12 25 30.84	1 29 12.5	114.75	4	14 4 33.50	7 21 10.0
5	12 27 36.88	1 17 44.0	114.70	5	14 6 36.15	7 31 27.3
6	12 29 42.78	1 6 15.8	114.63	6	14 8 38.80	7 41 42.0
7	12 31 48.54	0 54 48.0	114.58	7	14 10 41.46	7 51 54.1
8	12 33 54.16	0 43 20.5	114.50	8	14 12 44.11	8 2 3.4
9	12 35 59.64	0 31 53.5	114.42	9	14 14 46.78	8 12 10.1
10	12 38 4.99	0 20 27.0	114.32	10	14 16 49.45	8 22 13.9
11	12 40 10.22	N. 0 9 1.1	114.22	11	14 18 52.13	8 32 14.9
12	12 42 15.32	S. 0 2 24.2	114.10	12	14 20 54.82	8 42 13.1
13	12 44 20.30	0 13 48.8	113.98	13	14 22 57.52	8 52 8.4
14	12 46 25.16	0 25 12.7	113.87	14	14 25 0.24	9 2 0.7
15	12 48 29.91	0 36 35.9	113.72	15	14 27 2.98	9 11 50.0
16	12 50 34.55	0 47 58.2	113.57	16	14 29 5.74	9 21 36.4
17	12 52 39.08	0 59 19.6	113.42	17	14 31 8.52	9 31 19.6
18	12 54 43.50	1 10 40.1	113.25	18	14 33 11.32	9 40 59.8
19	12 56 47.82	1 21 59.6	113.07	19	14 35 14.15	9 50 36.8
20	12 58 52.04	1 33 18.0	112.90	20	14 37 17.01	10 0 10.6
21	13 0 56.17	1 44 35.4	112.70	21	14 39 19.90	10 9 41.2
22	13 3 0.21	1 55 51.6	112.52	22	14 41 22.82	10 19 8.6
23	13 5 4.15	S. 2 7 6.7	112.30	23	14 43 25.77	S. 10 28 32.6
TUESDAY 18.				THURSDAY 20.		
0	13 7 8.01	S. 2 18 20.5	112.08	0	14 45 28.76	S. 10 37 53.3
1	13 9 11.79	2 29 33.0	111.87	1	14 47 31.78	10 47 10.6
2	13 11 15.49	2 40 44.2	111.63	2	14 49 34.85	10 56 24.5
3	13 13 19.11	2 51 54.0	111.40	3	14 51 37.95	11 5 34.9
4	13 15 22.66	3 3 2.4	111.13	4	14 53 41.10	11 14 41.9
5	13 17 26.14	3 14 9.2	110.90	5	14 55 44.29	11 23 45.3
6	13 19 29.55	3 25 14.6	110.63	6	14 57 47.52	11 32 45.1
7	13 21 32.90	3 36 18.4	110.35	7	14 59 50.80	11 41 41.4
8	13 23 36.18	3 47 20.5	110.08	8	15 1 54.12	11 50 34.0
9	13 25 39.41	3 58 21.0	109.78	9	15 3 57.50	11 59 22.9
10	13 27 42.58	4 9 19.7	109.48	10	15 6 0.93	12 8 8.1
11	13 29 45.70	4 20 16.6	109.20	11	15 8 4.40	12 16 49.5
12	13 31 48.77	4 31 11.8	108.88	12	15 10 7.93	12 25 27.2
13	13 33 51.79	4 42 5.1	108.57	13	15 12 11.51	12 34 1.0
14	13 35 54.77	4 52 56.5	108.23	14	15 14 15.15	12 42 31.0
15	13 37 57.72	5 3 45.9	107.90	15	15 16 18.84	12 50 57.1
16	13 40 0.62	5 14 33.3	107.57	16	15 18 22.59	12 59 19.3
17	13 42 3.48	5 25 18.7	107.22	17	15 20 26.40	13 7 37.5
18	13 44 6.32	5 36 2.0	106.87	18	15 22 30.27	13 15 51.6
19	13 46 9.13	5 46 43.2	106.48	19	15 24 34.20	13 24 1.8
20	13 48 11.91	5 57 22.1	106.13	20	15 26 38.18	13 32 7.8
21	13 50 14.66	6 7 58.9	105.78	21	15 28 42.23	13 40 9.8
22	13 52 17.40	6 18 33.4	105.43			13 48 7.6
23	13 54 20.11	6 29 5.5	105.09			13 56 1.2
24	13 56 22.81	S. 6 39 35.3				50.6



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 21.				SUNDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	15 34 54.75	S. 14 3 50.6	77.52	0	17 15 33.88	S. 18 47 2.8	38.03
1	15 36 59.05	14 11 35.7	76.82	1	17 17 41.06	18 50 51.0	37.12
2	15 39 3.42	14 19 16.6	76.08	2	17 19 48.28	18 54 33.7	36.22
3	15 41 7.85	14 26 53.1	75.37	3	17 21 55.53	18 58 11.0	35.28
4	15 43 12.34	14 34 25.3	74.65	4	17 24 2.81	19 1 42.7	34.37
5	15 45 16.90	14 41 53.2	73.90	5	17 26 10.13	19 5 8.9	33.45
6	15 47 21.53	14 49 16.6	73.17	6	17 28 17.48	19 8 29.6	32.52
7	15 49 26.22	14 56 35.6	72.42	7	17 30 24.86	19 11 44.7	31.58
8	15 51 30.98	15 3 50.1	71.65	8	17 32 32.27	19 14 54.2	30.67
9	15 53 35.81	15 11 0.0	70.92	9	17 34 39.70	19 17 58.2	29.73
0	15 55 40.71	15 18 5.5	70.15	10	17 36 47.16	19 20 56.6	28.78
1	15 57 45.67	15 25 6.4	69.38	11	17 38 54.65	19 23 49.3	27.87
2	15 59 50.70	15 32 2.7	68.62	12	17 41 2.15	19 26 36.5	26.92
3	16 1 55.80	15 38 54.4	67.83	13	17 43 9.67	19 29 18.0	25.98
4	16 4 0.96	15 45 41.4	67.07	14	17 45 17.21	19 31 53.9	25.05
5	16 6 6.20	15 52 23.8	66.27	15	17 47 24.77	19 34 24.2	24.10
6	16 8 11.50	15 59 1.4	65.48	16	17 49 32.34	19 36 48.8	23.17
7	16 10 16.87	16 5 34.3	64.70	17	17 51 39.92	19 39 7.8	22.22
8	16 12 22.30	16 12 2.5	63.88	18	17 53 47.51	19 41 21.1	21.27
9	16 14 27.81	16 18 25.8	63.08	19	17 55 55.11	19 43 28.7	20.33
0	16 16 33.38	16 24 44.3	62.28	20	17 58 2.72	19 45 30.7	19.38
1	16 18 39.01	16 30 58.0	61.47	21	18 0 10.33	19 47 27.0	18.43
2	16 20 44.72	16 37 6.8	60.63	22	18 2 17.93	19 49 17.6	17.48
3	16 22 50.49	S. 16 43 10.6	59.83	23	18 4 25.54	S. 19 51 2.5	16.53
SATURDAY 22.				MONDAY 24.			
0	16 24 56.32	S. 16 49 9.6	59.00	0	18 6 33.15	S. 19 52 41.7	15.58
1	16 27 2.22	16 55 3.6	58.17	1	18 8 40.75	19 54 15.2	14.65
2	16 29 8.19	17 0 52.6	57.33	2	18 10 48.35	19 55 43.1	13.68
3	16 31 14.22	17 6 36.6	56.48	3	18 12 55.93	19 57 5.2	12.75
4	16 33 20.31	17 12 15.5	55.65	4	18 15 3.51	19 58 21.7	11.78
5	16 35 26.46	17 17 49.4	54.80	5	18 17 11.07	19 59 32.4	10.83
6	16 37 32.67	17 23 18.2	53.97	6	18 19 18.62	20 0 37.4	9.90
7	16 39 38.95	17 28 42.0	53.08	7	18 21 26.16	20 1 36.8	8.93
8	16 41 45.29	17 34 0.5	52.25	8	18 23 33.67	20 2 30.4	7.98
9	16 43 51.68	17 39 14.0	51.37	9	18 25 41.16	20 3 18.3	7.03
0	16 45 58.13	17 44 22.2	50.52	10	18 27 48.63	20 4 0.5	6.08
1	16 48 4.61	17 49 25.3	49.63	11	18 29 56.08	20 4 37.0	5.13
2	16 50 11.20	17 54 23.1	48.77	12	18 32 3.50	20 5 7.8	4.18
3	16 52 17.82	17 59 15.7	47.88	13	18 34 10.89	20 5 32.9	3.23
4	16 54 24.49	18 4 3.0	47.02	14	18 36 18.25	20 5 52.3	2.28
5	16 56 31.21	18 8 45.1	46.13	15	18 38 25.57	20 6 6.0	1.33
6	16 58 37.99	18 13 21.9	45.23	16	18 40 32.86	20 6 14.0	0.38
7	17 0 44.81	18 17 53.3	44.35	17	18 42 40.11	20 6 16.3	0.55
8	17 2 51.69	18 22 19.4	43.45	18	18 44 47.33	20 6 13.0	1.52
9	17 4 58.61	18 26 40.1	42.57	19	18 46 54.50	20 6 3.9	2.45
0	17 7 5.57	18 30 55.5	41.67	20	18 49 1.63	20 5 49.2	3.38
1	17 9 12.59	18 35 5.5	40.75	21	18 51 8.71	20 5 28.9	4.38
2	17 11 19.64	18 39 10.0	39.85	22	18 53 15.74	20 5 2.8	5.28
3	17 13 26.74	18 43 9.1	38.95	23	18 55 22.73	20 4 31.1	6.22
4	15 33.88	S. 18 47 2.8		24	18 57 29.66	S. 20 3 53.8	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 25.				THURSDAY 27.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	18 57 29.66	S. 20 3 53.8	7.17	0	20 37 28.56	S. 17 47 57.0	49.15
1	18 59 36.54	20 3 10.8	8.10	1	20 39 31.06	17 43 2.1	49.53
2	19 1 43.36	20 2 22.2	9.03	2	20 41 33.44	17 38 2.5	50.72
3	19 3 50.12	20 1 28.0	9.97	3	20 43 35.70	17 32 58.2	51.50
4	19 5 56.83	20 0 28.2	10.90	4	20 45 37.85	17 27 49.2	52.27
5	19 8 3.47	19 59 22.8	11.83	5	20 47 39.89	17 22 35.6	53.03
6	19 10 10.05	19 58 11.8	12.77	6	20 49 41.81	17 17 17.4	53.80
7	19 12 16.57	19 56 55.2	13.68	7	20 51 43.62	17 11 54.6	54.57
8	19 14 23.02	19 55 33.1	14.60	8	20 53 45.31	17 6 27.2	55.32
9	19 16 29.40	19 54 5.5	15.53	9	20 55 46.89	17 0 55.3	56.07
10	19 18 35.71	19 52 32.3	16.47	10	20 57 48.35	16 55 18.9	56.83
11	19 20 41.95	19 50 53.5	17.37	11	20 59 49.69	16 49 38.0	57.55
12	19 22 48.11	19 49 9.3	18.28	12	21 1 50.92	16 43 52.7	58.30
13	19 24 54.20	19 47 19.6	19.20	13	21 3 52.03	16 38 2.9	59.02
14	19 27 0.21	19 45 24.4	20.10	14	21 5 53.03	16 32 8.8	59.77
15	19 29 6.14	19 43 23.8	21.02	15	21 7 53.92	16 26 10.2	60.47
16	19 31 11.99	19 41 17.7	21.92	16	21 9 54.69	16 20 7.4	61.20
17	19 33 17.76	19 39 6.2	22.83	17	21 11 55.34	16 14 0.2	61.92
18	19 35 23.44	19 36 49.2	23.72	18	21 13 55.89	16 7 48.7	62.62
19	19 37 29.04	19 34 26.9	24.62	19	21 15 56.32	16 1 33.0	63.32
20	19 39 34.55	19 31 59.2	25.52	20	21 17 56.63	15 55 13.1	64.03
21	19 41 39.98	19 29 26.1	26.40	21	21 19 56.84	15 48 48.9	64.72
22	19 43 45.31	19 26 47.7	27.30	22	21 21 56.93	15 42 20.6	65.40
23	19 45 50.56	S. 19 24 3.9	28.18	23	21 23 56.91	S. 15 35 48.2	66.10
WEDNESDAY 26.				FRIDAY 28.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	19 47 55.71	S. 19 21 14.8	29.07	0	21 25 56.79	S. 15 29 11.6	66.77
1	19 50 0.76	19 18 20.4	29.95	1	21 27 56.55	15 22 31.0	67.45
2	19 52 5.73	19 15 20.7	30.82	2	21 29 56.21	15 15 46.3	68.12
3	19 54 10.59	19 12 15.8	31.70	3	21 31 55.76	15 8 57.6	68.78
4	19 56 15.36	19 9 5.6	32.55	4	21 33 55.20	15 2 4.9	69.45
5	19 58 20.02	19 5 50.3	33.43	5	21 35 54.53	14 55 8.2	70.10
6	20 0 24.59	19 2 29.7	34.30	6	21 37 53.76	14 48 7.6	70.75
7	20 2 29.06	18 59 3.9	35.15	7	21 39 52.88	14 41 3.1	71.38
8	20 4 33.42	18 55 33.0	36.00	8	21 41 51.89	14 33 54.8	72.03
9	20 6 37.68	18 51 57.0	36.85	9	21 43 50.81	14 26 42.6	72.68
10	20 8 41.84	18 48 15.9	37.70	10	21 45 49.62	14 19 26.5	73.30
11	20 10 45.89	18 44 29.7	38.55	11	21 47 48.34	14 12 6.7	73.92
12	20 12 49.83	18 40 38.4	39.38	12	21 49 46.95	14 4 43.2	74.53
13	20 14 53.66	18 36 42.1	40.22	13	21 51 45.46	13 57 16.0	75.17
14	20 16 57.39	18 32 40.8	41.05	14	21 53 43.88	13 49 45.0	75.77
15	20 19 1.01	18 28 34.5	41.88	15	21 55 42.21	13 42 10.4	76.37
16	20 21 4.52	18 24 23.2	42.72	16	21 57 40.43	13 34 32.2	76.97
17	20 23 7.92	18 20 6.9	43.52	17	21 59 38.57	13 26 50.4	77.57
18	20 25 11.20	18 15 45.8	44.33	18	22 1 36.61	13 19 5.0	78.15
19	20 27 14.38	18 11 19.8	45.15	19	22 3 34.57	13 11 16.1	78.73
20	20 29 17.44	18 6 48.9	45.97	20	22 5 32.43	13 3 23.7	79.32
21	20 31 20.39	18 2 13.1	46.77	21	22 7 30.21	12 55 27.8	79.90
22	20 33 23.23	17 57 32.5	47.55	22	22 9 27.90	12 47 28.4	80.47
23	20 35 25.95	17 52 47.2	48.37	23	22 11 25.51	12 39 25.6	81.02
24	20 37 28.56	S. 17 47 57.0		24	22 13 23.03	S. 12 31 19.5	

## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 29.				SUNDAY 30.			
0	22 13 23.03	S. 12 31 19.5	81.58	0	23 0 3.83	S. 9 1 17.1	93.45
1	22 15 20.46	12 23 10.0	82.13	1	23 1 59.93	8 51 56.4	93.87
2	22 17 17.84	12 14 57.2	82.68	2	23 3 56.00	8 42 33.2	94.30
3	22 19 15.13	12 6 41.1	83.23	3	23 5 52.05	8 33 7.4	94.72
4	22 21 12.34	11 58 21.7	83.77	4	23 7 48.08	8 23 39.1	95.13
5	22 23 9.48	11 49 59.1	84.30	5	23 9 44.08	8 14 8.3	95.53
6	22 25 6.55	11 41 33.3	84.83	6	23 11 40.07	8 4 35.1	95.95
7	22 27 3.55	11 33 4.3	85.35	7	23 13 36.05	7 54 59.4	96.38
8	22 29 0.48	11 24 32.2	85.87	8	23 15 32.01	7 45 21.4	96.73
9	22 30 57.34	11 15 57.0	86.38	9	23 17 27.96	7 35 41.0	97.12
10	22 32 54.14	11 7 18.7	86.88	10	23 19 23.90	7 25 58.3	97.50
11	22 34 50.88	10 58 37.4	87.40	11	23 21 19.84	7 16 13.3	97.87
12	22 36 47.56	10 49 53.0	87.88	12	23 23 15.77	7 6 26.1	98.25
13	22 38 44.18	10 41 5.7	88.38	13	23 25 11.71	6 56 36.6	98.60
14	22 40 40.75	10 32 15.4	88.87	14	23 27 7.65	6 46 45.0	98.97
15	22 42 37.26	10 23 22.2	89.35	15	23 29 3.59	6 36 51.2	99.32
16	22 44 33.72	10 14 26.1	89.83	16	23 30 59.55	6 26 55.3	99.67
17	22 46 30.13	10 5 27.1	90.28	17	23 32 55.51	6 16 57.3	100.02
18	22 48 26.50	9 56 25.4	90.77	18	23 34 51.49	6 6 57.2	100.35
19	22 50 22.82	9 47 20.8	91.22	19	23 36 47.49	5 56 55.1	100.68
20	22 52 19.10	9 38 13.5	91.68	20	23 38 43.51	5 46 51.0	101.00
21	22 54 15.33	9 29 3.4	92.13	21	23 40 39.56	5 36 45.0	101.32
22	22 56 11.53	9 19 50.6	92.57	22	23 42 35.63	5 26 37.1	101.63
23	22 58 7.70	9 10 35.2	93.02	23	23 44 31.73	5 16 27.3	101.95
24	23 0 3.83	S. 9 1 17.1		24	23 46 27.87	S. 5 6 15.6	

## PHASES OF THE MOON.

☾ Last Quarter	- - - - -	d h m	2 15 46.6
● New Moon	- - - - -	d h m	9 19 19.6
☽ First Quarter	- - - - -	d h m	16 10 22.6
○ Full Moon	- - - - -	d h m	24 2 10.2

☾ Perigee	- - - - -	d h	11 7
☾ Apogee	- - - - -	d h	26 16



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	P. L. of diff.
1	Antares W.	74 36 42 3103		76 4 48 3096		77 33 3 3090		79 1 25 3083	
	Saturn E.	55 37 50 3079		54 9 15 3074		52 40 34 3068		51 11 45 3062	
	α Arietis E.	73 37 54 3205		72 11 51 3203		70 45 45 3200		69 19 36 3197	
	SUN E.	108 17 37 3423		106 55 46 3416		105 33 47 3409		104 11 41 3401	
2	Antares W.	86 25 31 3043		87 54 50 3034		89 24 21 3024		90 54 4 3013	
	α Aquilæ W.	45 10 4 4172		46 18 57 4103		47 28 56 4040		48 39 56 3980	
	Saturn E.	43 45 38 3024		42 15 55 3016		40 46 2 3007		39 15 58 2998	
	α Arietis E.	62 7 53 3182		60 41 24 3178		59 14 49 3175		57 48 10 3172	
	SUN E.	97 18 58 3359		95 55 55 3350		91 32 41 3339		93 9 15 3328	
3	α Aquilæ W.	54 48 39 3733		56 4 51 3691		57 21 48 3650		58 39 28 3612	
	Saturn E.	31 42 30 2945		30 11 8 2933		28 39 31 2922		27 7 40 2909	
	α Arietis E.	50 34 15 3164		49 7 23 3164		47 40 31 3165		46 13 40 3168	
	SUN E.	86 8 46 3268		84 43 57 3254		83 18 52 3241		81 53 31 3226	
4	α Aquilæ W.	65 17 41 3442		66 39 10 3411		68 1 14 3381		69 23 52 3353	
	Fomalhaut W.	31 40 34 3899		32 53 55 3793		34 9 5 3697		35 25 55 3609	
	α Arietis E.	39 0 45 3205		37 34 42 3221		36 8 58 3240		34 43 36 3264	
	SUN E.	74 42 21 3149		73 15 11 3133		71 47 41 3117		70 19 52 3099	
5	α Aquilæ W.	76 24 59 3221		77 50 43 3197		79 16 56 3174		80 43 36 3151	
	Fomalhaut W.	42 11 21 3275		43 36 2 3221		45 1 46 3172		46 28 29 3125	
	α Pegasi W.	30 47 55 4299		31 54 49 4135		33 4 17 3990		34 16 7 3861	
	α Arietis E.	27 46 28 3502		26 26 6 3587		25 7 17 3694		23 50 23 3825	
	SUN E.	62 55 25 3010		61 25 25 2993		59 55 3 2974		58 24 18 2956	
6	α Aquilæ W.	88 3 32 3049		89 32 44 3031		91 2 19 3013		92 32 16 2997	
	Fomalhaut W.	53 55 15 2927		55 27 0 2893		56 59 28 2860		58 32 38 2828	
	α Pegasi W.	40 44 39 3381		42 7 17 3308		43 31 19 3242		44 56 39 3180	
	SUN E.	50 44 41 2862		49 11 34 2845		47 38 4 2826		46 4 10 2808	
7	α Aquilæ W.	100 6 45 2929		101 38 27 2919		103 10 22 2909		104 42 29 2902	
	Fomalhaut W.	66 28 12 2689		68 5 7 2664		69 42 35 2641		71 20 35 2618	
	α Pegasi W.	52 20 18 2929		53 52 0 2887		55 24 35 2849		56 57 59 2812	
	SUN E.	38 8 52 2722		36 32 41 2706		34 56 9 2690		33 19 16 2677	
11	SUN W.	17 0 23 2465		18 42 25 2443		20 24 59 2426		22 7 56 2414	
	Mars E.	38 51 1 2220		37 3 3 2219		35 15 4 2220		33 27 6 2221	
	Regulus E.	51 0 42 2046		49 8 20 2046		47 15 58 2046		45 23 35 2048	
	Jupiter E.	67 53 49 2074		66 2 9 2073		64 10 28 2073		62 18 48 2074	
12	SUN W.	30 45 37 2393		32 29 21 2394		34 13 4 2397		35 56 43 2400	
	Mars E.	24 28 11 2239		22 40 42 2246		20 53 23 2252		19 6 13 2261	
	Regulus E.	36 2 29 2062		34 10 31 2068		32 18 42 2073		30 27 1 2078	
	Jupiter E.	53 1 15 2090		51 10 0 2095		49 18 54 2101		47 27 56 2107	
	Spica ♀ E.	89 53 28 2092		88 2 16 2096		86 11 11 2102		84 20 14 2108	
13	SUN W.	44 33 21 2430		46 16 13 2438		47 58 53 2447		49 41 21 2457	
	Venus W.	18 31 14 2588		20 10 25 2583		21 49 44 2581		23 29 5 2583	
	Jupiter E.	38 15 46 2146		36 25 57 2156		34 36 23 2165		32 47 3 2176	
	Spica ♀ E.	75 8 12 2148		73 18 26 2157		71 28 54 2167		69 39 37 2178	
14	SUN W.	58 10 5 2511		59 51 3 2523		61 31 44 2535		63 12 9 2548	
	Venus W.	31 44 32 2614		33 23 8 2624		35 1 31 2635		36 39 39 2646	



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>	
1	Antares W.	80 29 55	3075	81 58 35	3069	83 27 23	3060	84 56 22	3052
	Saturn E.	49 42 49	3056	48 13 45	3048	46 44 32	3040	45 15 9	3034
	α Arietis E.	67 53 23	3194	66 27 6	3191	65 0 46	3188	63 34 23	3184
	SUN E.	102 49 26	3394	101 27 3	3386	100 4 31	3379	98 41 50	3369
2	Antares W.	92 23 58	3005	93 54 5	2993	95 24 26	2983	96 55 0	2972
	α Aquilæ W.	49 51 55	3225	51 4 49	3273	52 18 36	3224	53 33 13	3277
	Saturn E.	37 45 42	2987	36 15 13	2978	34 44 32	2967	33 13 38	2956
	α Arietis E.	56 21 28	3170	54 54 43	3168	53 27 55	3167	52 1 6	3165
	SUN E.	91 45 36	3318	90 21 45	3305	88 57 39	3294	87 33 20	3281
3	α Aquilæ W.	59 57 49	3576	61 16 50	3540	62 36 30	3507	63 56 47	3473
	Saturn E.	25 35 33	2898	24 3 12	2886	22 30 35	2875	20 57 44	2863
	α Arietis E.	44 46 53	3171	43 20 9	3177	41 53 32	3183	40 27 3	3193
	SUN E.	80 27 53	3211	79 1 57	3196	77 35 43	3182	76 9 12	3165
4	α Aquilæ W.	70 47 2	3325	72 10 45	3297	73 35 0	3272	74 59 44	3246
	Fomalhaut W.	36 44 20	3531	38 4 10	3459	39 25 20	3393	40 47 45	3331
	α Arietis E.	33 18 43	3294	31 54 25	3332	30 30 50	3377	29 8 7	3433
	SUN E.	68 51 41	3082	67 23 9	3065	65 54 16	3048	64 25 2	3029
5	α Aquilæ W.	82 10 44	3129	83 38 18	3108	85 6 18	3087	86 34 43	3068
	Fomalhaut W.	47 56 8	3082	49 24 40	3039	50 54 4	3001	52 24 16	2963
	α Pegasi W.	35 30 6	3745	36 46 6	3641	38 3 56	3546	39 23 29	3459
	α Arietis E.	22 35 47	3991	21 23 58	4200	20 15 32	4468	19 11 12	4812
	SUN E.	56 53 10	2937	55 21 38	2918	53 49 42	2901	52 17 24	2881
6	α Aquilæ W.	94 2 33	2981	95 33 10	2966	97 4 5	2953	98 35 17	2940
	Fomalhaut W.	60 6 29	2798	61 40 59	2769	63 16 7	2741	64 51 52	2715
	α Pegasi W.	46 23 12	3122	47 50 55	3069	49 19 42	3019	50 49 31	2973
	SUN E.	44 29 53	2790	42 55 12	2772	41 20 8	2755	39 44 41	2738
7	α Aquilæ W.	106 14 45	2896	107 47 9	2892	109 19 38	2889	110 52 11	2888
	Fomalhaut W.	72 59 6	2596	74 38 7	2574	76 17 37	2554	77 57 35	2535
	α Pegasi W.	58 32 11	2778	60 7 8	2746	61 42 47	2715	63 19 7	2687
	SUN E.	31 42 5	2662	30 4 34	2650	28 26 47	2638	26 48 44	2629
11	SUN W.	23 51 11	2406	25 34 37	2400	27 18 12	2396	29 1 53	2393
	Mars E.	31 39 10	2224	29 51 18	2227	28 3 30	2230	26 15 47	2235
	Regulus E.	43 31 15	2049	41 38 57	2051	39 46 43	2054	37 54 33	2058
	Jupiter E.	60 27 9	2077	58 35 34	2079	56 44 2	2083	54 52 36	2086
12	SUN W.	37 40 18	2405	39 23 46	2410	41 7		42 50 19	2423
	Mars E.	17 19 16	2270	15 32 32	2280	13 47		11 59 53	2309
	Regulus E.	28 35 28	2085	26 44 6	2093	24		23 1	2109
	Jupiter E.	45 37 8	2114	43 46 30	2121	41		40 5	18
	Spica η E.	82 29 27	2115	80 38 51	2122			76 58	19
13	SUN W.	51 23 35	2467	53 5 35	2477				
	Venus W.	25 8 24	2585	26 47 39	2594				
	Jupiter E.	30 57 59	2187	29 9 12	214				
	Spica η E.	67 50 37	2189	66 1 53	22				
14	SUN W.	64 52 15	2561	66 32 4	1				
	Venus W.	38 17 32	2657	39 55 10	1				



MEAN TIME.											
LUNAR DISTANCES.											
Day of the Month.	Star's Name and Position.		Noon.	P. L. of diff.	III <sup>b</sup> .	P. L. of diff.	VI <sup>b</sup> .	P. L. of diff.	IX <sup>b</sup> .	P. L. of diff.	
14	Jupiter	E.	23 44 32	2235	21 56 56	2247	20 9 39	2261	18 22 42	2275	
	Spica $\eta$	E.	60 37 29	2238	58 49 58	2252	57 2 48	2266	55 15 58	2280	
	Antares	E.	106 29 28	2260	104 42 30	2271	102 55 48	2283	101 9 23	2297	
15	SUN	W.	71 29 39	2615	73 8 13	2629	74 46 29	2643	76 24 25	2657	
	Venus	W.	44 46 24	2708	46 22 54	2720	47 59 7	2734	49 35 1	2747	
	Mars	W.	17 40 29	2491	19 21 55	2504	21 3 3	2516	22 43 54	2530	
	Spica $\eta$	E.	46 27 15	2358	44 42 40	2375	42 58 30	2392	41 14 44	2412	
	Antares	E.	92 21 40	2357	90 37 3	2370	88 52 45	2383	87 8 46	2397	
16	SUN	W.	84 29 16	2729	86 5 17	2744	87 40 58	2759	89 16 20	2773	
	Venus	W.	57 29 58	2819	59 4 1	2833	60 37 46	2848	62 11 12	2862	
	Mars	W.	31 3 27	2598	32 42 25	2612	34 21 4	2626	35 59 24	2640	
	Regulus	W.	21 46 6	2408	23 29 29	2422	25 12 32	2436	26 55 16	2449	
	Spica $\eta$	E.	32 42 55	2517	31 2 5	2542	29 21 50	2569	27 42 13	2599	
	Antares	E.	78 33 51	2467	76 51 52	2482	75 10 14	2497	73 28 56	2512	
17	SUN	W.	97 8 27	2845	98 41 57	2859	100 15 8	2873	101 48 2	2887	
	Venus	W.	69 53 47	2933	71 25 24	2947	72 56 43	2961	74 27 45	2975	
	Mars	W.	44 6 21	2709	45 42 49	2723	47 18 59	2736	48 54 51	2749	
	Regulus	W.	35 24 13	2515	37 5 5	2528	38 45 39	2541	40 25 55	2553	
	Jupiter	W.	17 58 27	2559	19 38 19	2570	21 17 55	2583	22 57 14	2595	
	Antares	E.	65 7 36	2586	63 28 22	2601	61 49 28	2617	60 10 56	2632	
18	SUN	W.	109 28 10	2954	110 59 21	2967	112 30 15	2979	114 0 54	2993	
	Venus	W.	81 58 38	3042	83 27 59	3055	84 57 4	3068	86 25 53	3080	
	Mars	W.	56 49 52	2814	58 24 2	2826	59 57 56	2838	61 31 34	2851	
	Regulus	W.	48 42 55	2615	50 21 29	2628	51 59 46	2639	53 37 48	2652	
	Jupiter	W.	31 9 44	2655	32 47 25	2666	34 24 50	2678	36 1 59	2690	
	Antares	E.	52 3 28	2711	50 27 3	2728	48 51 0	2744	47 15 19	2762	
	$\alpha$ Aquilæ	E.	99 19 37	3160	97 52 40	3168	96 25 52	3176	94 59 14	3185	
19	SUN	W.	121 30 13	3053	122 59 20	3065	124 28 13	3077	125 56 51	3088	
	Venus	W.	93 46 13	3140	95 13 34	3152	96 40 40	3163	98 7 34	3177	
	Mars	W.	69 15 53	2909	70 48 1	2920	72 19 55	2931	73 51 35	2942	
	Regulus	W.	61 44 5	2706	63 20 37	2717	64 56 54	2727	66 32 58	2738	
	Jupiter	W.	44 3 58	2745	45 39 38	2756	47 15 4	2766	48 50 16	2776	
	Antares	E.	39 22 49	2858	37 49 36	2880	36 16 51	2902	34 44 35	2928	
	$\alpha$ Aquilæ	E.	87 48 58	3239	86 23 35	3251	84 58 26	3264	83 33 32	3277	
20	Venus	W.	105 18 43	3228	106 44 19	3237	108 9 44	3248	109 34 56	3257	
	Mars	W.	81 26 37	2993	82 56 59	3002	84 27 10	3011	85 57 9	3021	
	Regulus	W.	74 29 59	2785	76 4 46	2795	77 39 20	2804	79 13 43	2813	
	Jupiter	W.	56 42 59	2825	58 16 54	2835	59 50 36	2844	61 24 7	2853	
	Spica $\eta$	W.	21 40 5	3001	23 10 17	2985	24 40 49	2972	26 11 37	2963	
	Antares	E.	27 12 7	3092	25 43 48	3139	24 16 26	3193	22 50 8	3256	
	$\alpha$ Aquilæ	E.	76 33 17	3355	75 10 9	3373	73 47 22	3392	72 24 56	3410	
21	Mars	W.	93 24 15	3065	94 53 8	3073	96 21 51	3081	97 50 24	3089	
	Jupiter	W.	69 8 52	2895	70 41 17	2904	72 13 31	2912	73 45 35	2919	
	Spica $\eta$	W.	33 47 27	2949	35 18 44	2950	36 49 59	2952	38 21 12	2954	
	$\alpha$ Aquilæ	E.	65 38 31	3521	64 18 30	3547	62 58 58	3574	61 39 55	3603	
	Fomalhaut	E.	98 16 47	3119	96 49 0	3125	95 21 21	3131	93 53 49	3138	



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>h</sup> .	P.L. of diff.	XVIII <sup>h</sup> .	P.L. of diff.	XXI <sup>h</sup> .	P.L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>	
14	Jupiter E.	16 36 7	2291	14 49 54	2308	13 4 6	2326	11 18 44	2348
	Spica $\pi$ E.	53 29 29	2295	51 43 22	2309	49 57 36	2326	48 12 14	2342
	Antares E.	99 23 14	2307	97 37 24	2318	95 51 51	2331	94 6 36	2344
15	SUN W.	78 2 2	2672	79 39 20	2687	81 16 18	2701	82 52 57	2716
	Venus W.	51 10 38	2762	52 45 56	2776	54 20 55	2791	55 55 35	2804
	Mars W.	24 24 26	2543	26 4 40	2556	27 44 35	2571	29 24 10	2584
	Spica $\pi$ E.	39 31 26	2430	37 48 34	2450	36 6 11	2472	34 24 18	2493
	Antares E.	85 25 7	2411	83 41 48	2425	81 58 49	2439	80 16 10	2453
16	SUN W.	90 51 23	2788	92 26 7	2802	94 0 32	2816	95 34 39	2831
	Venus W.	63 44 20	2877	65 17 9	2891	66 49 40	2905	68 21 53	2920
	Mars W.	37 37 25	2654	39 15 6	2667	40 52 30	2682	42 29 34	2696
	Regulus W.	28 37 41	2463	30 19 47	2476	32 1 34	2489	33 43 3	2502
	Spica $\pi$ E.	26 3 17	2632	24 25 5	2670	22 47 45	2712	21 11 21	2763
	Antares E.	71 47 59	2526	70 7 22	2541	68 27 6	2556	66 47 11	2571
17	SUN W.	103 20 38	2900	104 52 57	2914	106 24 58	2927	107 56 43	2941
	Venus W.	75 58 29	2988	77 28 57	3002	78 59 7	3016	80 29 0	3028
	Mars W.	50 30 26	2763	52 5 43	2776	53 40 43	2789	55 15 26	2802
	Regulus W.	42 5 54	2567	43 45 35	2580	45 24 58	2591	47 4 5	2604
	Jupiter W.	24 36 17	2606	26 15 4	2618	27 53 34	2631	29 31 47	2643
	Antares E.	58 32 44	2647	56 54 53	2663	55 17 23	2679	53 40 15	2695
18	SUN W.	115 31 16	3005	117 1 23	3017	118 31 15	3029	120 0 52	3042
	Venus W.	87 54 27	3092	89 22 46	3105	90 50 49	3117	92 18 38	3129
	Mars W.	63 4 56	2863	64 38 2	2874	66 10 54	2886	67 43 31	2898
	Regulus W.	55 15 33	2662	56 53 4	2674	58 30 19	2685	60 7 19	2696
	Jupiter W.	37 38 53	2701	39 15 32	2713	40 51 55	2723	42 28 4	2734
	Antares E.	45 40 1	2779	44 5 6	2798	42 30 36	2817	40 56 30	2836
	$\alpha$ Aquilæ E.	93 32 47	3194	92 6 31	3204	90 40 27	3215	89 14 36	3226
19	SUN W.	127 25 15	3099	128 53 26	3110	130 21 23	3122	131 49 6	3133
	Venus W.	99 34 13	3185	101 0 40	3197	102 26 53	3207	103 52 54	3217
	Mars W.	75 23 1	2952	76 54 14	2962	78 25 14	2972	79 56 2	2982
	Regulus W.	68 8 48	2747	69 44 25	2757	71 19 49	2767	72 55 0	2776
	Jupiter W.	50 25 15	2787	52 0 0	2796	53 34 33	2807	55 8 52	2816
	Antares E.	33 12 51	2954	31 41 41	2984	30 11 8	3016	28 41 15	3052
	$\alpha$ Aquilæ E.	82 8 54	3292	80 44 33	3307	79 20 30	3322	77 56 44	3339
20	Venus W.	110 59 58	3267	112 24 48	3277	113 49 27	3286	115 13 55	3294
	Mars W.	87 26 56	3030	88 56 32	3039	90 25 57	3048	91 55 11	3056
	Regulus W.	80 47 54	2821	82 21 54	2830	83 55 43	2838	85 29 21	2846
	Jupiter W.	62 57 26	2862	64 30 34	2870	66 3 31	2879	67 36 17	2887
	Spica $\pi$ W.	27 42 36	2957	29 13 43	2953	30 44 55	2950	32 16 11	2950
	Antares E.	21 25 5	3332	20 1 30	3423	18 39 39	3535	17 19 53	3678
	$\alpha$ Aquilæ E.	71 2 51	3430	69 41 9	3452	68 19 51	3474	66 58 58	3498
21	Mars W.	99 18 47	3097	100 47 0	3105	102 15 4	3112	103 42 5 <sup>a</sup>	
	Jupiter W.	75 17 30	2927	76 49 15	2935	78 20 50	2942	79 52	
	Spica $\pi$ W.	39 52 23	2957	41 23 30	2960	42 54 33	2963	44 2	
	$\alpha$ Aquilæ E.	60 21 24	3633	59 3 25	3665	57 46 1	3699	56 1	
	Fomalhaut E.	92 26 26	3144	90 59 10	3152	89 32 3	3159	88	



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	P. L. of diff.
22	Mars W.	105 10 46 3127	106 38 23 3134	108 5 52 3141	109 33 12 3148				
	Jupiter W.	81 23 33 2956	82 54 41 2962	84 25 41 2970	85 56 32 2978				
	Spica $\pi$ W.	45 56 26 2970	47 27 16 2975	48 58 0 2979	50 28 39 2983				
	$\alpha$ Aquilæ E.	55 13 4 3774	53 57 35 3815	52 42 48 3859	51 28 47 3903				
	Fomalhaut E.	86 38 16 3174	85 11 36 3182	83 45 5 3190	82 18 44 3198				
	$\alpha$ Pegasi E.	101 40 56 3268	100 16 5 3271	98 51 19 3274	97 26 37 3277				
23	Jupiter W.	93 28 44 3008	94 58 47 3014	96 28 43 3020	97 58 31 3026				
	Spica $\pi$ W.	58 0 33 3006	59 30 39 3010	61 0 39 3014	62 30 34 3018				
	Antares W.	14 42 28 3990	15 54 18 3820	17 9 0 3692	18 25 56 3736				
	Fomalhaut E.	75 9 35 3244	73 44 18 3254	72 19 13 3265	70 54 21 3276				
	$\alpha$ Pegasi E.	90 24 28 3305	89 0 22 3310	87 36 22 3316	86 12 29 3322				
	Saturn E.	120 15 59 2992	118 45 36 2998	117 15 20 3002	115 45 10 3006				
24	Jupiter W.	105 25 52 3052	106 55 1 3056	108 24 4 3061	109 53 2 3066				
	Spica $\pi$ W.	69 58 47 3041	71 28 9 3044	72 57 27 3049	74 26 39 3053				
	Antares W.	25 11 26 3328	26 35 5 3301	27 59 16 3277	29 23 51 3233				
	Fomalhaut E.	63 53 17 3336	62 29 47 3351	61 6 34 3365	59 43 37 3379				
	$\alpha$ Pegasi E.	79 15 12 3362	77 52 12 3371	76 29 22 3380	75 6 43 3389				
	Saturn E.	108 16 1 3033	106 46 29 3038	105 17 3 3043	103 47 43 3048				
25	Spica $\pi$ W.	81 51 31 3071	83 20 16 3074	84 48 57 3077	86 17 35 3080				
	Antares W.	36 31 30 3202	37 57 37 3194	39 23 53 3188	40 50 16 3182				
	Fomalhaut E.	52 53 31 3470	51 32 33 3491	50 11 59 3515	48 51 51 3539				
	$\alpha$ Pegasi E.	68 16 19 3445	66 54 53 3457	65 33 41 3470	64 12 43 3482				
	Saturn E.	96 22 17 3066	94 53 26 3069	93 24 39 3073	91 55 57 3076				
26	Spica $\pi$ W.	93 39 48 3094	95 8 5 3096	96 36 20 3097	98 4 33 3099				
	Antares W.	48 3 27 3166	49 30 17 3163	50 57 10 3162	52 24 5 3160				
	$\alpha$ Pegasi E.	57 32 8 3567	56 12 58 3587	54 54 9 3609	53 35 44 3631				
	Saturn E.	84 33 15 3038	83 4 51 3091	81 36 30 3092	80 8 11 3093				
	$\alpha$ Arietis E.	99 44 19 3219	98 18 32 3219	96 52 46 3220	95 27 1 3221				
27	Antares W.	59 39 19 3149	61 6 29 3147	62 33 42 3145	64 0 57 3143				
	$\alpha$ Pegasi E.	47 10 21 3774	45 54 52 3810	44 40 0 3850	43 25 49 3886				
	Saturn E.	72 46 58 3097	71 18 45 3098	69 50 33 3098	68 22 21 3098				
	$\alpha$ Arietis E.	88 18 30 3225	86 52 50 3225	85 27 10 3226	84 1 31 3226				
28	Antares W.	71 17 59 3129	72 45 34 3125	74 13 13 3122	75 40 56 3118				
	$\alpha$ Pegasi E.	37 27 24 4188	36 18 47 4269	35 11 26 4361	34 5 29 4553				
	Saturn E.	61 1 2 3090	59 32 40 3088	58 4 16 3085	56 35 48 3082				
	$\alpha$ Arietis E.	76 53 21 3226	75 27 43 3226	74 2 4 3226	72 36 26 3226				
	SUN E.	137 24 37 3445	136 3 11 3441	134 41 41 3438	133 20 7 3434				
29	Antares W.	83 0 46 3096	84 29 1 3090	85 57 23 3084	87 25 52 3078				
	$\alpha$ Aquilæ W.	42 44 54 4386	43 50 28 4307	44 57 14 4236	46 5 6 4174				
	Saturn E.	49 12 31 3064	47 43 37 3058	46 14 36 3053	44 45 29 3048				
	$\alpha$ Arietis E.	65 28 11 3224	64 2 30 3225	62 36 50 3224	61 11 9 3224				
	SUN E.	126 31 4 3408	125 8 57 3403	123 46 44 3397	122 24 24 3392				
30	Antares W.	94 50 13 3044	96 19 31 3036	97 48 59 3027	99 18 38 3019				
	$\alpha$ Aquilæ W.	51 58 52 3903	53 12 9 3859	54 26 11 3818	55 40 55 3777				
	Saturn E.	37 18 3 3014	35 48 8 3007	34 18 4 2999	32 47 50 2991				
	$\alpha$ Arietis E.	54 2 49 3227	52 37 12 3230	51 11 38 3231	49 46 5 3232				
	SUN E.	115 30 39 3350	114 7 25 3342	112 44 2 3332	111 20 27 3324				



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>	
22	Mars W.	111 0 23	3154	112 27 27	3161	113 54 23	3168	115 21 11	3174
	Jupiter W.	87 27 14	2982	88 57 49	2989	90 28 15	2996	91 58 33	3002
	Spica $\pi$ g W.	51 59 13	2987	53 29 42	2993	55 0 4	2996	56 30 22	3001
	$\alpha$ Aquilæ E.	50 15 34	3957	49 3 12	4013	47 51 45	4072	46 41 16	4136
	Fomalhaut E.	80 52 33	3207	79 26 32	3216	78 0 42	3226	76 35 3	3235
	$\alpha$ Pegasi E.	96 2 0	3282	94 37 28	3288	93 13 2	3293	91 48 42	3298
23	Jupiter W.	99 28 13	3030	100 57 48	3036	102 27 16	3042	103 56 37	3047
	Spica $\pi$ g W.	64 0 23	3023	65 30 7	3027	66 59 46	3032	68 29 19	3036
	Antares W.	19 44 40	3513	21 4 50	3451	22 26 9	3401	23 48 24	3360
	Fomalhaut E.	69 29 41	3288	68 5 14	3299	66 41 1	3310	65 17 2	3323
	$\alpha$ Pegasi E.	84 48 45	3330	83 25 8	3338	82 1 41	3345	80 38 22	3353
	Saturn E.	114 15 8	3014	112 45 12	3018	111 15 22	3023	109 45 38	3029
24	Jupiter W.	111 21 53	3070	112 50 39	3074	114 19 20	3078	115 47 56	3083
	Spica $\pi$ g W.	75 55 47	3056	77 24 50	3061	78 53 48	3064	80 22 42	3068
	Antares W.	30 48 53	3243	32 14 11	3230	33 39 45	3219	35 5 32	3209
	Fomalhaut E.	58 20 57	3396	56 58 36	3413	55 36 34	3431	54 14 52	3449
	$\alpha$ Pegasi E.	73 44 14	3400	72 21 57	3410	70 59 52	3421	69 37 59	3432
	Saturn E.	102 18 28	3051	100 49 18	3055	99 20 13	3059	97 51 13	3062
25	Spica $\pi$ g W.	87 46 8	3083	89 14 38	3087	90 43 4	3088	92 11 28	3092
	Antares W.	42 16 45	3179	43 43 19	3175	45 9 58	3172	46 36 41	3169
	Fomalhaut E.	47 32 10	3566	46 12 59	3595	44 54 19	3626	43 36 13	3661
	$\alpha$ Pegasi E.	62 52 2	3498	61 31 36	3515	60 11 28	3531	58 51 38	3549
	Saturn E.	90 27 18	3078	88 58 42	3082	87 30 10	3084	86 1 41	3087
26	Spica $\pi$ g W.	99 32 43	3101	101 0 51	3102	102 28 58	3104	103 57 3	3105
	Antares W.	53 51 3	3157	55 18 4	3156	56 45 6	3153	58 12 12	3152
	$\alpha$ Pegasi E.	52 17 43	3655	51 0 8	3682	49 43 2	3710	48 26 25	3741
	Saturn E.	78 39 54	3095	77 11 38	3096	75 43 24	3096	74 15 10	3098
	$\alpha$ Arietis E.	94 1 17	3222	92 35 34	3223	91 9 52	3223	89 44 10	3225
27	Antares W.	65 28 15	3140	66 55 36	3138	68 23 0	3134	69 50 28	3132
	$\alpha$ Pegasi E.	42 12 22	3941	40 59 44	3994	39 47 58	4052	38 37 10	4116
	Saturn E.	66 54 8	3096	65 25 53	3096	63 57 38	3094	62 29 21	3092
	$\alpha$ Arietis E.	82 35 53	3226	81 10 14	3226	79 44 36	3227	78 18 59	3226
28	Antares W.	77 8 43	3114	78 36 36	3110	80 4 34	3105	81 32 37	3101
	$\alpha$ Pegasi E.	33 1 4	4579	31 58 21	4710	30 57 30	4861	29 58 44	5034
	Saturn E.	55 7 18	3079	53 38 43	3076	52 10 4	3072	50 41 20	3068
	$\alpha$ Arietis E.	71 10 48	3226	69 45 9	3226	68 19 30	3225	66 53 50	3226
	SUN E.	131 58 29	3430	130 36 46	3424	129 14 57	3421	127 53 4	3415
29	Antares W.	88 54 28	3073	90 23 11	3065	91 52 3	3058	93 51	3051
	$\alpha$ Aquilæ W.	47 14 0	4109	48 23 53	4052	49 34 41	3999	50	
	Saturn E.	43 16 15	3042	41 46 54	3035	40 17 25	3029	38	
	$\alpha$ Arietis E.	59 45 29	3224	58 19 48	3225	56 54 8	3225		
	SUN E.	121 1 56	3383	119 39 20	3376	118 16 36	3367		
30	Antares W.	100 48 26	3010	102 18 26	3002	103 48 37	2993		
	$\alpha$ Aquilæ W.	56 56 20	3741	58 12 24	3706	59 29 5	3671		
	Saturn E.	31 17 26	2983	29 46 52	2974	28 16 7	2961		
	$\alpha$ Arietis E.	48 20 37	3238	46 55 13	3243	45 29 55	3227		
	SUN E.	109 56 40	3312	108 32 42	3301	107 8 31	3281		



## CONFIGURATIONS OF THE SATELLITES OF JUPITER,

At 8<sup>h</sup> 30<sup>m</sup>, MEAN TIME.

Day of the Month.	West.			East.		
1	1. ○		·3	○	·2 ·4	
2			·3	○ 2 ·1		·4
3		·2	1. ○	○	·3	·4
4	·2 ●			○	·1	·3 4*
5			·1	○	2. 3.	4.
6	3. ○		2.	○	1.	4.
7		3.	·2 ·1	○		4.
8		·3		○ 1 ·4	·2	
9			·3 4.	○ 2.		● ·1
10		4.	·2 1.	○	·3	
11		4.		○	·1	·3 ● ·3
12		4.	·1	○	2. 3.	
13		·4		○ 3. 1.		
14		·4	3. ·2 ·1	○		
15		·4 ·3		○ 1. ·2		
16			·3 ·4	○ 2.		● ·1
17			2.	1. ○	·4	● ·3
18				· ○ 2	·1	·4 ·3
19			1.	○	2. 3.	·4
20			2.	○ 3. 1.		·4
21		·2 3.	·1	○		4.
22			3.	○	1. ·2	4.
23			·3	·1 ○	2.	4.
24	1. ○		2.	○	4.	● ·3
25	4. ○		·2	○ ·1	·3	
26			4. 1.	○	2. 3.	
27		4.		○	·1 3.	○ 2.
28		4.	·2 3. 1.	○		
29		·4	3.	○	·2 1.	
30		·4	·3	·1 ○	2.	

This Table represents, at 8<sup>h</sup> 30<sup>m</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the page; the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of the Satellites' motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite placed by the side of it is on the disc of Jupiter, and a black circle (●) that it is either *behind* the disc, or in the shadow, of Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

SATELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.		h m s	h m s	
	2†	8 11 11.1	12 54 55.4	Em.
	4	2 39 52.1	7 30 35.1	Em.
	5	21 8 31.6	2 6 13.3	Em.
	7	15 37 14.7	20 41 55.1	Em.
	9*	10 5 54.3	15 17 33.3	Em.
	11.	4 34 35.5	9 53 13.3	Em.
	12	23 3 14.9	4 28 51.3	Em.
	14	17 31 58.8	23 4 33.9	Em.
	16†	12 0 38.3	17 40 12.1	Em.
	18	6 29 19.8	12 15 52.3	Em.
	20	0 57 59.5	6 51 30.6	Em.
	21	19 26 43.5	1 27 13.3	Em.
	23	13 55 22.9	20 2 51.4	Em.
	25†	8 24 4.9	14 38 32.1	Em.
	27	2 52 44.2	9 14 10.0	Em.
	28	21 21 28.4	3 49 53.0	Em.
	30	15 50 7.8	22 25 31.0	Em.
II.	4†	8 55 37.1	13 47 21.8	Em.
	7	22 14 27.5	3 20 13.1	Em.
	11*	11 32 26.0	16 52 12.3	Em.
	15	0 51 10.4	6 24 57.6	Em.
	18	14 9 6.4	19 56 54.4	Em.
	22	3 27 44.6	9 29 33.5	Em.
	25	16 45 37.8	23 1 27.4	Em.
	29	6 4 8.6	12 33 59.0	Em.
III.	2	22 34 48.5	3 20 54.6	Im.
	3	1 39 52.0	6 26 28.6	Em.
	10	2 34 3.3	7 48 24.7	Im.
	10	5 38 19.7	10 53 11.3	Em.
	17	6 32 57.4	12 15 33.9	Im.
	17*	9 36 27.4	15 19 34.1	Em.
	24*	10 31 52.4	16 42 44.0	Im.
	24	13 34 35.9	19 45 57.5	Em.
IV.	17*	10 25 39.5	16 8 54.3	Im.
	17	13 7 16.1	18 50 57.4	Em.



APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHADOWS.	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Egress.
	d h m	d h m	d h m	d h m	d h m	d h
I.	2 9 23		1 12 10	1* 14 29	1† 13 27	1* 15 4
	3 3 59		3 6 46	3 9 4	3 8 3	3 10 2
	5 22 35		4 1 22	4 3 40	4 2 38	5 4 3
	7† 17 10		6 19 58	6 22 16	6 21 14	6 23 3
	9 11 46		8* 14 33	8† 16 52	8* 15 50	8 18
	11 6 22		10 9 9	10 11 27	10 10 26	10 12 4
	12 0 58	In	11 3 45	12 6 3	11 5 2	12 7 1
	14 19 34		13 22 21	13 0 39	13 23 37	13 1 3
	16† 14 10	the	15† 16 57	15 19 15	15 18 13	15 20 3
	18 8 46		17 11 33	17 13 51	17 12 49	17† 15
	19 3 22		19 6 9	19 8 28	19 7 25	19 9 4
	21 21 58	Shadow.	20 0 46	20 3 4	20 2 0	20 4 1
	23* 16 34		22 19 22	22 21 40	22 20 36	22 22 3
	25 11 10		24 13 58	24* 16 16	24† 15 12	24† 17 2
	26 5 47		26 8 34	26 10 53	26 9 48	26 12
	28 0 23		27 3 11	27 5 29	27 4 23	28 6 4
	30 18 59		29 21 47	29 0 6	29 22 59	29 1 1
II.	4 8 25		2† 13 16	2* 16 6	2* 15 52	2 18 4
	7 21 58		5 2 47	6 5 38	6 5 23	6 8 1
	11 11 30	In	9* 16 19	9 19 10	9 18 55	9 21 4
	14 1 4		13 5 51	13 8 42	13 8 26	13 11 1
	18† 14 38	the	16 19 24	16 22 15	16 21 58	16 0 4
	21 4 13		20 8 58	20 11 49	20 11 30	20† 14 1
	25† 17 47	Shadow.	23 22 31	23 1 22	23 1 1	23 3 4
	29 7 22		27 12 6	27† 14 57	27 14 33	27† 17 2
			30 1 40	30 4 31	30 4 5	31 6 5
III.	2 22 1	2 1 28	6 12 10	6* 15 37	6† 17 24	6 20 4
	9 2 29	10 5 56	13* 16 40	13 20 7	13 21 52	13 1
	17 7 0	17 10 27	20 21 14	20 0 41	20 2 20	20 5 3
	24 11 35	24† 15 2	27 1 50	27 5 17	28 6 47	28 10
IV.	16 3 44	17 7 40	8* 16 20	8 20 16	8 4 38	9 7 4
			25 11 57	25* 15 52	25 23 48	25 2 4

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>d</sup> . 629573. Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	−0.7841	−1.2859	+9.2203	+0.8651	19 18 22.67	70	151	.413
2	0.7624	1.2883	9.2285	0.8654	19 14 26.76	71	152	.416
3	0.7394	1.2906	9.2366	0.8656	19 10 30.85	72	153	.419
4	−0.7150	−1.2928	+9.2446	+0.8659	19 6 34.94	73	154	.422
5	0.6890	1.2948	9.2525	0.8661	19 2 39.03	74	155	.424
6	0.6613	1.2967	9.2602	0.8663	18 58 43.12	75	156	.427
7	−0.6315	−1.2984	+9.2679	+0.8664	18 54 47.21	76	157	.430
8	0.5994	1.3001	9.2754	0.8665	18 50 51.29	77	158	.433
9	0.5646	1.3016	9.2829	0.8666	18 46 55.38	78	159	.435
10	−0.5267	−1.3030	+9.2903	+0.8666	18 42 59.47	79	160	.438
11	0.4850	1.3042	9.2975	0.8666	18 39 3.56	80	161	.441
12	0.4387	1.3054	9.3046	0.8666	18 35 7.65	81	162	.444
13	−0.3868	−1.3064	+9.3117	+0.8666	18 31 11.74	82	163	.446
14	0.3277	1.3073	9.3187	0.8665	18 27 15.83	83	164	.449
15	0.2592	1.3080	9.3255	0.8663	18 23 19.92	84	165	.452
16	−0.1777	−1.3087	+9.3323	+0.8662	18 19 24.01	85	166	.454
17	0.0772	1.3092	9.3390	0.8660	18 15 28.10	86	167	.457
18	9.9459	1.3096	9.3455	0.8658	18 11 32.18	87	168	.460
19	−9.7569	−1.3099	+9.3520	+0.8655	18 7 36.27	88	169	.463
20	−9.4143	1.3100	9.3584	0.8652	18 3 40.36	89	170	.465
21	+8.7175	1.3101	9.3647	0.8648	17 59 44.45	90	171	.468
22	+9.5610	−1.3100	+9.3709	+0.8644	17 55 48.54	91	172	.471
23	9.8296	1.3098	9.3771	0.8640	17 51 52.63	92	173	.474
24	9.9942	1.3095	9.3831	0.8636	17 47 56.72	93	174	.476
25	+0.1132	−1.3090	+9.3890	+0.8631	17 44 0.80	94	175	.479
26	0.2064	1.3085	9.3949	0.8626	17 40 4.89	95	176	.482
27	0.2830	1.3078	9.4007	0.8620	17 36 8.98	96	177	.485
28	+0.3480	−1.3070	+9.4063	+0.8614	17 32 13.07	97	178	.487
29	0.4044	1.3061	9.4119	0.8608	17 28 17.16	98	179	.490
30	0.4542	1.3050	9.4175	0.8601	17 24 21.25	99	180	.493
31	+0.4988	−1.3038	+9.4229	+0.8594	17 20 25.34	100	181	.496



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>"</sup>
Mon.	1	6 40 7.52	10.338	N.23 8 9.9	10.42	1 8 72	3 23.22	0.480
Tues.	2	6 44 15.63	10.328	23 3 59.7	11.43	1 8 68	3 34.74	0.470
Wed.	3	6 48 23.49	10.316	22 59 25.3	12.43	1 8 64	3 46.01	0.458
Thur.	4	6 52 31.08	10.304	22 54 26.9	13.43	1 8 60	3 57.01	0.446
Frid.	5	6 56 38.38	10.291	22 49 4.5	14.42	1 8 55	4 7.72	0.433
Sat.	6	7 0 45.36	10.277	22 43 18.3	15.41	1 8 50	4 18.12	0.419
Sun.	7	7 4 52.01	10.262	22 37 8.5	16.39	1 8 45	4 28.18	0.404
Mon.	8	7 8 58.29	10.246	22 30 35.1	17.37	1 8 40	4 37.88	0.388
Tues.	9	7 13 4.18	10.229	22 23 38.3	18.33	1 8 35	4 47.19	0.372
Wed.	10	7 17 9.68	10.211	22 16 18.4	19.29	1 8 29	4 56.11	0.354
Thur.	11	7 21 14.75	10.192	22 8 35.4	20.25	1 8 23	5 4.60	0.335
Frid.	12	7 25 19.36	10.173	22 0 29.5	21.19	1 8 17	5 12.63	0.315
Sat.	13	7 29 23.51	10.153	21 52 1.0	22.12	1 8 10	5 20.20	0.296
Sun.	14	7 33 27.18	10.132	21 43 10.0	23.05	1 8 03	5 27.30	0.275
Mon.	15	7 37 30.35	10.110	21 33 56.8	23.97	1 7 96	5 33.89	0.253
Tues.	16	7 41 33.00	10.088	21 24 21.6	24.88	1 7 89	5 39.96	0.231
Wed.	17	7 45 35.12	10.066	21 14 24.5	25.78	1 7 82	5 45.51	0.209
Thur.	18	7 49 36.70	10.043	21 4 5.8	26.67	1 7 75	5 50.52	0.185
Frid.	19	7 53 37.72	10.019	20 53 25.7	27.55	1 7 68	5 54.97	0.162
Sat.	20	7 57 38.17	9.995	20 42 24.5	28.42	1 7 60	5 58.86	0.139
Sun.	21	8 1 38.06	9.972	20 31 2.4	29.28	1 7 52	6 2.19	0.115
Mon.	22	8 5 37.38	9.948	20 19 19.6	30.13	1 7 44	6 4.94	0.093
Tues.	23	8 9 36.12	9.924	20 7 16.4	30.97	1 7 36	6 7.12	0.071
Wed.	24	8 13 34.29	9.900	19 54 53.1	31.80	1 7 28	6 8.73	0.043
Thur.	25	8 17 31.88	9.875	19 42 9.8	32.62	1 7 20	6 9.76	0.018
Frid.	26	8 21 28.88	9.850	19 29 6.8	33.43	1 7 11	6 10.20	0.006
Sat.	27	8 25 25.29	9.826	19 15 44.4	34.23	1 7 03	6 10.06	0.030
Sun.	28	8 29 21.12	9.802	19 2 2.9	35.02	1 6 94	6 9.34	0.055
Mon.	29	8 33 16.36	9.778	18 48 2.5	35.79	1 6 86	6 8.03	0.079
Tues.	30	8 37 11.02	9.753	18 33 43.5	36.56	1 6 77	6 6.13	0.103
Wed.	31	8 41 5.10	9.729	18 19 6.1	37.31	1 6 68	6 3.66	0.127
Thur.	32	8 44 58.59		N.18 4 10.7		1 6 59	6 0.61	

\* Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup>. 19 from the Sidereal Time.

## AT MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S			Equation of Time, to be subtracted from Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
Mon.	1	6 40 6.94	N.23 8 10.5	15 45.1	3 23.19	6 36 43.75
Tues.	2	6 44 15.02	23 4 0.4	15 45.1	3 34.71	6 40 40.31
Wed.	3	6 48 22.84	22 59 26.1	15 45.1	3 45.98	6 44 36.86
Thur.	4	6 52 30.40	22 54 27.8	15 45.1	3 56.98	6 48 33.42
Frid.	5	6 56 37.67	22 49 5.5	15 45.1	4 7.69	6 52 29.98
Sat.	6	7 0 44.62	22 43 19.4	15 45.1	4 18.09	6 56 26.53
Sun.	7	7 4 51.24	22 37 9.7	15 45.1	4 28.15	7 0 23.09
Mon.	8	7 8 57.50	22 30 36.4	15 45.1	4 37.85	7 4 19.65
Tues.	9	7 13 3.37	22 23 39.8	15 45.2	4 47.16	7 8 16.20
Wed.	10	7 17 8.84	22 16 20.0	15 45.2	4 56.08	7 12 12.76
Thur.	11	7 21 13.89	22 8 37.1	15 45.2	5 4.57	7 16 9.32
Frid.	12	7 25 18.48	22 0 31.4	15 45.3	5 12.61	7 20 5.88
Sat.	13	7 29 22.61	21 52 3.0	15 45.3	5 20.18	7 24 2.43
Sun.	14	7 33 26.26	21 43 12.2	15 45.4	5 27.27	7 27 58.99
Mon.	15	7 37 29.41	21 33 59.1	15 45.4	5 33.86	7 31 55.54
Tues.	16	7 41 32.05	21 24 23.9	15 45.5	5 39.94	7 35 52.10
Wed.	17	7 45 34.15	21 14 26.9	15 45.6	5 45.49	7 39 48.66
Thur.	18	7 49 35.72	21 4 8.4	15 45.6	5 50.50	7 43 45.21
Frid.	19	7 53 36.73	20 53 28.5	15 45.7	5 54.96	7 47 41.77
Sat.	20	7 57 37.17	20 42 27.4	15 45.8	5 58.85	7 51 38.33
Sun.	21	8 1 37.05	20 31 5.4	15 45.9	6 2.17	7 55 34.88
Mon.	22	8 5 36.37	20 19 22.7	15 46.0	6 4.93	7 59 31.44
Tues.	23	8 9 35.11	20 7 19.6	15 46.1	6 7.12	8 3 27.99
Wed.	24	8 13 33.28	19 54 56.3	15 46.2	6 8.73	8 7 24.55
Thur.	25	8 17 30.86	19 42 13.1	15 46.3	6 9.76	8 11
Frid.	26	8 21 27.86	19 29 10.2	15 46.4	6 10.20	8 15
Sat.	27	8 25 24.27	19 15 47.9	15 46.5	6 10.06	8
Sun.	28	8 29 20.11	19 2 6.5	15 46.6	6 9.34	8
Mon.	29	8 33 15.36	18 48 6.2	15 46.7	6 8.03	8
Tues.	30	8 37 10.03	18 33 47.2	15 46.8	6 6.14	8
Wed.	31	8 41 4.11	18 19 9.9	15 46.9	6 3.67	8
Thur.	32	8 44 57.62	N.18 4 14.5	15 47.0	6 0.62	8

\* The Semidiameter for *Apparent* Noon may be assumed the same as the



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax.	
	Noon.	*Noon.		Noon.	Midnight.	Noon.	Midnight.
1	99 12 53.9	S. 0.36	0.0072116	15 1.9	15 6.9	55 9.7	55 28.2
2	100 10 5.8	0.44	0.0072155	15 12.6	15 18.8	55 48.9	56 11.7
3	101 7 17.9	0.50	0.0072174	15 25.5	15 32.7	56 36.4	57 2.7
4	102 4 30.4	0.53	0.0072172	15 40.2	15 47.9	57 30.2	57 58.6
5	103 1 43.1	0.53	0.0072147	15 55.8	16 3.6	58 27.4	58 56.0
6	103 58 56.2	0.50	0.0072096	16 11.1	16 18.2	59 23.7	59 49.9
7	104 56 9.6	0.44	0.0072020	16 24.7	16 30.4	60 13.7	60 34.6
8	105 53 23.3	0.36	0.0071919	16 35.1	16 38.6	60 51.7	61 4.7
9	106 50 37.1	0.25	0.0071791	16 40.9	16 41.9	61 13.1	61 16.8
10	107 47 51.3	S. 0.13	0.0071636	16 41.6	16 40.0	61 15.6	61 9.6
11	108 45 5.7	0.00	0.0071456	16 37.1	16 33.0	60 59.0	60 44.2
12	109 42 20.1	N. 0.13	0.0071250	16 28.0	16 22.2	60 25.8	60 4.4
13	110 39 34.7	0.25	0.0071018	16 15.8	16 8.8	59 40.8	59 15.4
14	111 36 49.5	0.37	0.0070762	16 1.6	15 54.4	58 49.0	58 22.3
15	112 34 4.4	0.47	0.0070483	15 47.1	15 40.0	57 55.6	57 29.5
16	113 31 19.5	0.55	0.0070181	15 33.1	15 26.6	57 4.3	56 40.5
17	114 28 34.7	0.59	0.0069859	15 20.5	15 14.8	56 18.1	55 57.2
18	115 25 50.2	0.61	0.0069518	15 9.6	15 4.9	55 38.0	55 20.6
19	116 23 5.8	0.60	0.0069159	15 0.6	14 56.8	55 4.9	54 50.9
20	117 20 21.6	0.55	0.0068784	14 53.4	14 50.5	54 38.5	54 27.8
21	118 17 37.8	0.48	0.0068394	14 48.0	14 45.9	54 18.7	54 11.1
22	119 14 54.6	0.38	0.0067989	14 44.2	14 43.0	54 4.9	54 0.3
23	120 12 11.8	0.27	0.0067570	14 42.1	14 41.6	53 57.0	53 55.1
24	121 9 29.7	0.14	0.0067137	14 41.4	14 41.7	53 54.6	53 55.7
25	122 6 48.4	N. 0.01	0.0066692	14 42.4	14 43.4	53 58.2	54 2.0
26	123 4 7.8	S. 0.12	0.0066233	14 44.9	14 46.7	54 7.2	54 14.0
27	124 1 28.0	0.25	0.0065760	14 49.0	14 51.7	54 22.4	54 32.4
28	124 58 49.3	0.36	0.0065274	14 54.9	14 58.5	54 44.0	54 57.4
29	125 56 11.6	0.45	0.0064773	15 2.6	15 7.2	55 12.5	55 29.2
30	126 53 34.9	0.51	0.0064256	15 12.3	15 17.8	55 47.8	56 8.3
31	127 50 59.5	0.55	0.0063722	15 23.9	15 30.3	56 30.4	56 53.9
32	128 48 25.3	S. 0.56	0.0063170	15 37.0	15 44.2	57 18.7	57 44.8

## MEAN TIME.

		THE MOON'S							
Day of the Week.	Day of the Month.	Longitude.		Latitude.		Age.	Meridian		
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.		
Mon.	1	354 51 54.7	1 1 48.6	S. 3 20 14.5	S. 3 44 56.4	21.2	17 41.2		
Tues.	2	7 16 19.4	13 36 1.3	4 7 17.5	4 26 57.0	22.2	18 26.1		
Wed.	3	20 1 25.9	26 33 1.6	4 43 34.3	4 56 48.8	23.2	19 13.0		
Thur.	4	33 11 11.9	39 56 14.5	5 6 20.1	5 11 49.0	24.2	20 2.7		
Frid.	5	46 48 19.6	53 47 28.3	5 12 57.7	5 9 31.5	25.2	20 56.0		
Sat.	6	60 53 31.5	68 6 9.5	5 1 19.3	4 48 15.4	26.2	21 53.3		
Sun.	7	75 24 50.9	82 48 52.7	4 30 20.3	4 7 41.8	27.2	22 54.2		
Mon.	8	90 17 21.7	97 49 15.6	3 40 35.8	3 9 27.1	28.2	23 57.2		
Tues.	9	105 23 25.8	112 58 39.5	2 34 48.0	1 57 17.4	29.2	♂		
Wed.	10	120 33 43.0	128 7 25.0	S. 1 17 41.3	S. 0 36 48.1	0.9	1 0.2		
Thur.	11	135 38 38.8	143 6 24.9	N. 0 4 32.2	N. 0 45 30.6	1.9	2 1.2		
Frid.	12	150 29 52.8	157 48 21.3	1 25 20.2	2 3 19.6	2.9	2 59.0		
Sat.	13	165 1 19.8	172 8 27.3	2 38 51.8	3 11 26.7	3.9	3 53.2		
Sun.	14	179 9 32.0	186 4 30.5	3 40 40.1	4 6 13.2	4.9	4 44.4		
Mon.	15	192 53 26.3	199 36 29.1	4 27 53.2	4 45 32.7	5.9	5 33.3		
Tues.	16	206 13 52.8	212 45 55.3	4 59 7.3	5 8 36.8	6.9	6 20.8		
Wed.	17	219 12 57.0	225 35 19.6	5 14 3.8	5 15 33.6	7.9	7 7.7		
Thur.	18	231 53 26.3	238 7 40.3	5 13 13.2	5 7 11.1	8.9	7 54.7		
Frid.	19	244 18 24.4	250 26 1.4	4 57 37.4	4 44 43.8	9.9	8 42.1		
Sat.	20	256 30 52.6	262 33 18.5	4 28 42.3	4 9 46.8	10.9	9 30.0		
Sun.	21	268 33 39.0	274 32 13.2	3 48 11.4	3 24 11.4	11.9	10 18.4		
Mon.	22	280 29 18.5	286 25 12.2	2 58 3.4	2 30 3.7	12.9	11 6.7		
Tues.	23	292 20 11.1	298 14 31.6	2 0 30.1	1 29 40.8	13.9	11 54.5		
Wed.	24	304 8 30.0	310 2 23.4	N. 0 57 54.9	N. 0 25 30.7	14	11 4		
Thur.	25	315 56 28.6	321 51 3.9	S. 0 7 11.8	S. 0 39 53.4		1		
Frid.	26	327 46 28.1	333 43 1.3	1 12 14.2	1 43 54.2		7		
Sat.	27	339 41 4.5	345 41 0.7	2 14 35.9	2 43 57		5.5		
Sun.	28	351 43 13.6	357 48 7.9	3 11 41.4	3 37 2		0		
Mon.	29	3 56 9.7	10 7 46.1	4 0 58.2	4 21 53		8		
Tues.	30	16 23 23.7	22 43 30.0	4 39 56.7	4 54 49				
Wed.	31	29 8 31.0	35 38 51.7	5 6 13.1	5 13 52				
Thur.	32	42 14 54.1	48 56 56.7	S. 5 17 32.3	S. 5 1				



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 1.				WEDNESDAY 3.			
0	23 46 27.87	S. 5 6 15.6	102.25	0	1 21 5.23	N. 3 27 15.2	109.27
1	23 48 24.04	4 56 2.1	102.53	1	1 23 7.06	3 38 10.8	109.26
2	23 50 20.25	4 45 46.9	102.83	2	1 25 9.10	3 49 6.3	109.20
3	23 52 16.51	4 35 29.9	103.12	3	1 27 11.34	4 0 1.5	109.18
4	23 54 12.81	4 25 11.2	103.40	4	1 29 13.80	4 10 56.4	109.10
5	23 56 9.15	4 14 50.8	103.67	5	1 31 16.47	4 21 51.0	109.03
6	23 58 5.55	4 4 28.8	103.93	6	1 33 19.36	4 32 45.2	108.95
7	0 0 2.00	3 54 5.2	104.20	7	1 35 22.47	4 43 38.9	108.87
8	0 1 58.52	3 43 40.0	104.45	8	1 37 25.81	4 54 32.1	108.78
9	0 3 55.09	3 33 13.3	104.70	9	1 39 29.38	5 5 24.8	108.68
10	0 5 51.73	3 22 45.1	104.95	10	1 41 33.19	5 16 16.9	108.57
11	0 7 48.43	3 12 15.4	105.18	11	1 43 37.23	5 27 8.3	108.46
12	0 9 45.21	3 1 44.3	105.42	12	1 45 41.51	5 37 59.0	108.32
13	0 11 42.06	2 51 11.8	105.63	13	1 47 46.04	5 48 48.9	108.18
14	0 13 38.99	2 40 38.0	105.85	14	1 49 50.81	5 59 38.0	108.03
15	0 15 35.99	2 30 2.9	106.07	15	1 51 55.83	6 10 26.2	107.88
16	0 17 33.09	2 19 26.5	106.28	16	1 54 1.11	6 21 13.5	107.72
17	0 19 30.27	2 8 48.8	106.48	17	1 56 6.65	6 31 59.8	107.53
18	0 21 27.54	1 58 9.9	106.67	18	1 58 12.45	6 42 45.0	107.35
19	0 23 24.90	1 47 29.9	106.85	19	2 0 18.51	6 53 29.1	107.15
20	0 25 22.36	1 36 48.8	107.05	20	2 2 24.85	7 4 12.0	106.95
21	0 27 19.93	1 26 6.5	107.20	21	2 4 31.45	7 14 53.7	106.72
22	0 29 17.60	1 15 23.3	107.38	22	2 6 38.33	7 25 34.0	106.50
23	0 31 15.37	S. 1 4 39.0	107.55	23	2 8 45.49	N. 7 36 13.0	106.27
TUESDAY 2.				THURSDAY 4.			
0	0 33 13.26	S. 0 53 53.7	107.70	0	2 10 52.93	N. 7 46 50.6	106.02
1	0 35 11.27	0 43 7.5	107.85	1	2 13 0.66	7 57 26.7	105.75
2	0 37 9.39	0 32 20.4	107.98	2	2 15 8.67	8 8 1.2	105.48
3	0 39 7.63	0 21 32.5	108.13	3	2 17 16.98	8 18 34.1	105.22
4	0 41 6.00	S. 0 10 43.7	108.25	4	2 19 25.59	8 29 5.4	104.92
5	0 43 4.50	N. 0 0 5.8	108.38	5	2 21 34.49	8 39 34.9	104.60
6	0 45 3.13	0 10 56.1	108.48	6	2 23 43.69	8 50 2.5	104.30
7	0 47 1.90	0 21 47.0	108.60	7	2 25 53.20	9 0 28.3	103.98
8	0 49 0.81	0 32 38.6	108.70	8	2 28 3.02	9 10 52.2	103.63
9	0 50 59.86	0 43 30.8	108.78	9	2 30 13.14	9 21 14.0	103.30
10	0 52 59.05	0 54 23.5	108.88	10	2 32 23.59	9 31 33.8	102.93
11	0 54 58.40	1 5 16.8	108.95	11	2 34 34.34	9 41 51.4	102.57
12	0 56 57.90	1 16 10.5	109.02	12	2 36 45.42	9 52 6.8	102.18
13	0 58 57.56	1 27 4.6	109.10	13	2 38 56.82	10 2 19.9	101.78
14	1 0 57.38	1 37 59.2	109.13	14	2 41 8.55	10 12 30.6	101.40
15	1 2 57.36	1 48 54.0	109.20	15	2 43 20.60	10 22 39.0	100.97
16	1 4 57.51	1 59 49.2	109.23	16	2 45 32.99	10 32 44.8	100.53
17	1 6 57.84	2 10 44.6	109.27	17	2 47 45.71	10 42 48.0	100.10
18	1 8 58.34	2 21 40.2	109.28	18	2 49 58.76	10 52 48.6	99.63
19	1 10 59.02	2 32 35.9	109.32	19	2 52 12.16	11 2 46.4	99.17
20	1 12 59.88	2 43 31.8	109.32	20	2 54 25.89	11 12 41.4	98.70
21	1 15 0.93	2 54 27.7	109.32	21	2 56 39.97	11 22 33.6	98.20
22	1 17 2.17	3 5 23.6	109.30	22	2 58 54.40	11 32 22.8	97.70
23	1 19 3.60	3 16 19.4	109.30	23	3 1 9.17	11 42 9.0	97.18
24	1 21 5.23	N. 3 27 15.2		24	3 3 24.30	N. 11 51 52.1	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 5.				SUNDAY 7.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	3 3 24.30	N. 11 51 52.1	96.65	0	4 58 42.77	N. 18 10 41.5	54.93
1	3 5 39.78	12 1 32.0	96.10	1	5 1 15.74	18 16 11.1	53.72
2	3 7 55.61	12 11 8.6	95.55	2	5 3 49.03	18 21 33.4	52.50
3	3 10 11.80	12 20 41.9	94.98	3	5 6 22.64	18 26 48.4	51.27
4	3 12 28.35	12 30 11.8	94.40	4	5 8 56.57	18 31 56.0	50.02
5	3 14 45.25	12 39 38.2	93.80	5	5 11 30.81	18 36 56.1	48.77
6	3 17 2.53	12 49 1.0	93.20	6	5 14 5.35	18 41 48.7	47.48
7	3 19 20.16	12 58 20.2	92.57	7	5 16 40.20	18 46 33.6	46.22
8	3 21 38.16	13 7 35.6	91.93	8	5 19 15.35	18 51 10.9	44.92
9	3 23 56.53	13 16 47.2	91.28	9	5 21 50.78	18 55 40.4	43.60
10	3 26 15.26	13 25 54.9	90.62	10	5 24 26.51	19 0 2.0	42.30
11	3 28 34.37	13 34 58.6	89.93	11	5 27 2.52	19 4 15.8	40.97
12	3 30 53.84	13 43 58.2	89.25	12	5 29 38.80	19 8 21.6	39.63
13	3 33 13.69	13 52 53.7	88.55	13	5 32 15.36	19 12 19.4	38.28
14	3 35 33.91	14 1 45.0	87.82	14	5 34 52.18	19 16 9.1	36.92
15	3 37 54.50	14 10 31.9	87.08	15	5 37 29.26	19 19 50.6	35.55
16	3 40 15.47	14 19 14.4	86.35	16	5 40 6.60	19 23 23.9	34.17
17	3 42 36.81	14 27 52.5	85.58	17	5 42 44.18	19 26 48.9	32.78
18	3 44 58.53	14 36 26.0	84.80	18	5 45 22.01	19 30 5.6	31.38
19	3 47 20.63	14 44 54.8	84.02	19	5 48 0.07	19 33 13.9	29.98
20	3 49 43.10	14 53 18.9	83.20	20	5 50 38.35	19 36 13.8	28.55
21	3 52 5.95	15 1 38.1	82.40	21	5 53 16.86	19 39 5.1	27.13
22	3 54 29.18	15 9 52.5	81.55	22	5 55 55.59	19 41 47.9	25.70
23	3 56 52.79	N. 15 18 1.8	80.72	23	5 58 34.52	N. 19 44 22.1	24.27
SATURDAY 6.				MONDAY 8.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	3 59 16.77	N. 15 26 6.1	79.85	0	6 1 13.65	N. 19 46 47.7	22.82
1	4 1 41.13	15 34 5.2	78.98	1	6 3 52.98	19 49 4.6	21.35
2	4 4 5.86	15 41 59.1	78.08	2	6 6 32.49	19 51 12.7	19.88
3	4 6 30.97	15 49 47.6	77.17	3	6 9 12.18	19 53 12.0	18.42
4	4 8 56.46	15 57 30.6	76.27	4	6 11 52.04	19 55 2.5	16.95
5	4 11 22.32	16 5 8.2	75.33	5	6 14 32.07	19 56 44.2	15.45
6	4 13 48.56	16 12 40.2	74.37	6	6 17 12.26	19 58 16.9	13.98
7	4 16 15.16	16 20 6.4	73.42	7	6 19 52.59	19 59 40.8	12.47
8	4 18 42.14	16 27 26.9	72.45	8	6 22 33.06	20 0 55.6	10.98
9	4 21 9.49	16 34 41.6	71.45	9	6 25 13.67	20 2 1.5	9.48
10	4 23 37.21	16 41 50.3	70.45	10	6 27 54.41	20 2 58.4	7.97
11	4 26 5.29	16 48 53.0	69.43	11	6 30 35.26	20 3 46.2	6.44
12	4 28 33.74	16 55 49.6	68.40	12	6 33 16.22	20 4 25.0	
13	4 31 2.55	17 2 40.0	67.35	13	6 35 57.28	20 4 54.1	
14	4 33 31.73	17 9 24.1	66.28	14	6 38 38.44	20 5 17	
15	4 36 1.26	17 16 1.8	65.22	15	6 41 19.68	20 5 1	
16	4 38 31.15	17 22 33.1	64.13	16	6 44 0.99	20 5 1	
17	4 41 1.40	17 28 57.9	63.02	17	6 46 42.38	20 5 1	
18	4 43 32.00	17 35 16.0	61.92	18	6 49 23.82	20 5 1	
19	4 46 2.94	17 41 27.5	60.78	19	6 52 5.31	20 4 1	
20	4 48 34.23	17 47 32.2	59.63	20	6 54 46.85	20 4 1	
21	4 51 5.86	17 53 30.0	58.48	21	6 57 28.42	20 3 1	
22	4 53 37.83	17 59 20.9	57.30	22	7 0 10.02	20 3 1	
23	4 56 10.13	18 5 4.7	56.13	23	7 2 51.64	20 3 1	
24	4 58 42.77	N. 18 10 41.5		24	7 5 33.27	N. 20	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .
TUESDAY 9.				THURSDAY 11.			
0	7 5 33.27	N.20 0 17.5	13.37	0	9 12 31.78	N.16 13 48.9	
1	7 8 14.90	19 58 57.3	14.88	1	9 15 4.97	16 5 56.4	
2	7 10 56.52	19 57 28.0	16.42	2	9 17 37.85	15 57 57.3	
3	7 13 38.13	19 55 49.5	17.93	3	9 20 10.42	15 49 51.9	
4	7 16 19.71	19 54 1.9	19.47	4	9 22 42.69	15 41 40.2	
5	7 19 1.26	19 52 5.1	20.97	5	9 25 14.64	15 33 22.3	
6	7 21 42.77	19 49 59.3	22.50	6	9 27 46.27	15 24 58.2	
7	7 24 24.23	19 47 44.3	23.98	7	9 30 17.59	15 16 28.2	
8	7 27 5.64	19 45 20.4	25.52	8	9 32 48.59	15 7 52.2	
9	7 29 46.97	19 42 47.3	27.00	9	9 35 19.26	14 59 10.3	
10	7 32 28.24	19 40 5.3	28.50	10	9 37 49.61	14 50 22.7	
11	7 35 9.43	19 37 14.3	30.00	11	9 40 19.64	14 41 29.4	
12	7 37 50.52	19 34 14.3	31.48	12	9 42 49.34	14 32 30.6	
13	7 40 31.52	19 31 5.4	32.97	13	9 45 18.71	14 23 26.3	
14	7 43 12.41	19 27 47.6	34.45	14	9 47 47.75	14 14 16.6	
15	7 45 53.19	19 24 20.9	35.92	15	9 50 16.46	14 5 1.6	
16	7 48 33.85	19 20 45.4	37.37	16	9 52 44.84	13 55 41.4	
17	7 51 14.38	19 17 1.2	38.83	17	9 55 12.89	13 46 16.2	
18	7 53 54.78	19 13 8.2	40.28	18	9 57 40.61	13 36 45.9	
19	7 56 35.03	19 9 6.5	41.72	19	10 0 7.99	13 27 10.8	
20	7 59 15.13	19 4 56.2	43.15	20	10 2 35.04	13 17 30.9	
21	8 1 55.08	19 0 37.3	44.57	21	10 5 1.76	13 7 46.2	
22	8 4 34.86	18 56 9.9	45.98	22	10 7 28.14	12 57 57.0	
23	8 7 14.47	N.18 51 34.0	47.38	23	10 9 54.19	N.12 48 3.2	
WEDNESDAY 10.				FRIDAY 12.			
0	8 9 53.91	N.18 46 49.7	48.78	0	10 12 19.90	N.12 38 5.0	
1	8 12 33.16	18 41 57.0	50.17	1	10 14 45.28	12 28 2.5	
2	8 15 12.22	18 36 56.0	51.55	2	10 17 10.32	12 17 55.7	
3	8 17 51.08	18 31 46.7	52.92	3	10 19 35.03	12 7 44.8	
4	8 20 29.74	18 26 29.2	54.25	4	10 21 59.41	11 57 29.9	
5	8 23 8.19	18 21 3.7	55.62	5	10 24 23.45	11 47 11.0	
6	8 25 46.43	18 15 30.0	56.93	6	10 26 47.17	11 36 48.3	
7	8 28 24.44	18 9 48.4	58.27	7	10 29 10.55	11 26 21.8	
8	8 31 2.23	18 3 58.8	59.57	8	10 31 33.61	11 15 51.6	
9	8 33 39.78	17 58 1.4	60.87	9	10 33 56.33	11 5 17.9	
10	8 36 17.09	17 51 56.2	62.15	10	10 36 18.73	10 54 40.7	
11	8 38 54.17	17 45 43.3	63.43	11	10 38 40.80	10 44 0.0	
12	8 41 30.99	17 39 22.7	64.68	12	10 41 2.55	10 33 16.1	
13	8 44 7.56	17 32 54.6	65.93	13	10 43 23.97	10 22 29.0	
14	8 46 43.87	17 26 19.0	67.18	14	10 45 45.07	10 11 38.7	
15	8 49 19.91	17 19 35.9	68.38	15	10 48 5.85	10 0 45.4	
16	8 51 55.69	17 12 45.6	69.60	16	10 50 26.31	9 49 49.2	
17	8 54 31.19	17 5 48.0	70.80	17	10 52 46.46	9 38 50.1	
18	8 57 6.42	16 58 43.2	71.97	18	10 55 6.29	9 27 48.3	
19	8 59 41.37	16 51 31.4	73.13	19	10 57 25.80	9 16 43.8	
20	9 2 16.04	16 44 12.6	74.30	20	10 59 45.01	9 5 36.7	
21	9 4 50.41	16 36 46.8	75.43	21	11 2 3.91	8 54 27.1	
22	9 7 24.50	16 29 14.2	76.55	22	11 4 22.50	8 43 15.1	
23	9 9 58.29	16 21 34.9	77.67	23	11 6 40.79	8 32 0.8	
24	9 12 31.78	N.16 13 48.9		24	11 8 58.77	N. 8 20 44.3	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 13.				MONDAY 15.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	11 8 58.77	N.8 20 44.3	113.12	0	12 54 22.77	S.0 58 51.6	115.67
1	11 11 16.46	8 9 25.6	113.47	1	12 56 29.59	1 10 25.6	115.47
2	11 13 33.85	7 58 4.8	113.78	2	12 58 36.28	1 21 58.4	115.25
3	11 15 50.94	7 46 42.1	114.10	3	13 0 42.82	1 33 29.9	115.02
4	11 18 7.74	7 35 17.5	114.42	4	13 2 49.22	1 45 0.0	114.78
5	11 20 24.25	7 23 51.0	114.68	5	13 4 55.48	1 56 28.7	114.55
6	11 22 40.48	7 12 22.9	114.98	6	13 7 1.62	2 7 56.0	114.28
7	11 24 56.42	7 0 53.0	115.22	7	13 9 7.62	2 19 21.7	114.03
8	11 27 12.08	6 49 21.7	115.48	8	13 11 13.51	2 30 45.9	113.75
9	11 29 27.46	6 37 48.8	115.72	9	13 13 19.27	2 42 8.4	113.48
10	11 31 42.56	6 26 14.5	115.93	10	13 15 24.91	2 53 29.3	113.20
11	11 33 57.39	6 14 38.9	116.15	11	13 17 30.44	3 4 48.5	112.90
12	11 36 11.95	6 3 2.0	116.33	12	13 19 35.85	3 16 5.9	112.60
13	11 38 26.24	5 51 24.0	116.52	13	13 21 41.15	3 27 21.5	112.28
14	11 40 40.27	5 39 44.9	116.70	14	13 23 46.35	3 38 35.2	111.98
15	11 42 54.04	5 28 4.7	116.83	15	13 25 51.45	3 49 47.1	111.63
16	11 45 7.54	5 16 23.7	117.00	16	13 27 56.45	4 0 56.9	111.32
17	11 47 20.80	5 4 41.7	117.12	17	13 30 1.36	4 12 4.8	110.97
18	11 49 33.80	4 52 59.0	117.25	18	13 32 6.17	4 23 10.6	110.62
19	11 51 46.55	4 41 15.5	117.35	19	13 34 10.89	4 34 14.3	110.27
20	11 53 59.05	4 29 31.4	117.45	20	13 36 15.52	4 45 15.9	109.90
21	11 56 11.31	4 17 46.7	117.53	21	13 38 20.08	4 56 15.3	109.52
22	11 58 23.33	4 6 1.5	117.60	22	13 40 24.55	5 7 12.4	109.15
23	12 0 35.12	N.3 54 15.9	117.67	23	13 42 28.94	S.5 18 7.3	108.75
SUNDAY 14.				TUESDAY 16.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	12 2 46.67	N.3 42 29.9	117.72	0	13 44 33.26	S.5 28 59.8	108.37
1	12 4 57.99	3 30 43.6	117.75	1	13 46 37.51	5 39 50.0	107.95
2	12 7 9.09	3 18 57.1	117.78	2	13 48 41.68	5 50 37.7	107.55
3	12 9 19.97	3 7 10.4	117.80	3	13 50 45.80	6 1 23.0	107.13
4	12 11 30.62	2 55 23.6	117.80	4	13 52 49.85	6 12 5.8	106.70
5	12 13 41.06	2 43 36.8	117.78	5	13 54 53.84	6 22 46.0	106.27
6	12 15 51.28	2 31 50.1	117.78	6	13 56 57.77	6 33 23.6	105.85
7	12 18 1.30	2 20 3.4	117.75	7	13 59 1.65	6 43 58.7	105.38
8	12 20 11.11	2 8 16.9	117.70	8	14 1 5.48	6 54 31.0	104.95
9	12 22 20.71	1 56 30.7	117.65	9	14 3 9.26	7 5 0.7	104.48
10	12 24 30.12	1 44 44.8	117.60	10	14 5 13.00	7 11 0.2	104.02
11	12 26 39.33	1 32 59.2	117.52	11	14 7 16.69	7 17 5.5	103.55
12	12 28 48.35	1 21 14.1	117.43	12	14 9 20.35		
13	12 30 57.18	1 9 29.5	117.35	13	14 11 23.96		
14	12 33 5.82	0 57 45.4	117.25	14	14 13 27.5		
15	12 35 14.28	0 46 1.9	117.13	15	14 15 31.1		
16	12 37 22.56	0 34 19.1	117.00	16	14 17 34.1		
17	12 39 30.67	0 22 37.1	116.87	17	14 19 38.1		
18	12 41 38.60	N.0 10 55.9	116.73	18	14 21 41.57		
19	12 43 46.36	S.0 0 44.5	116.58	19	14 23 45.07		
20	12 45 53.96	0 12 24.0	116.42	20	14 25 48.48		
21	12 48 1.40	0 24 2.5	116.25	21	14 27		
22	12 50 8.68	0 35 40.0	116.07	22	14 29		
23	12 52 15.80	0 47 16.4	115.87	23	14 31		
24	12 54 22.77	S.0 58 51.6		24	14 3		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
<i>WEDNESDAY 17.</i>				<i>FRIDAY 19.</i>			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	14 34 1 <sup>98</sup>	S. 9 36 33 <sup>6</sup>	96 <sup>83</sup>	0	16 13 6 <sup>77</sup>	S. 16 8 35 <sup>1</sup>	63 <sup>83</sup>
1	14 36 5 <sup>34</sup>	9 46 14 <sup>6</sup>	96 <sup>27</sup>	1	16 15 11 <sup>63</sup>	16 14 58 <sup>4</sup>	63 <sup>05</sup>
2	14 38 8 <sup>69</sup>	9 55 52 <sup>2</sup>	95 <sup>70</sup>	2	16 17 16 <sup>54</sup>	16 21 16 <sup>9</sup>	62 <sup>28</sup>
3	14 40 12 <sup>04</sup>	10 5 26 <sup>4</sup>	95 <sup>13</sup>	3	16 19 21 <sup>50</sup>	16 27 30 <sup>6</sup>	61 <sup>47</sup>
4	14 42 15 <sup>39</sup>	10 14 57 <sup>2</sup>	94 <sup>55</sup>	4	16 21 26 <sup>52</sup>	16 33 39 <sup>4</sup>	60 <sup>55</sup>
5	14 44 18 <sup>74</sup>	10 24 24 <sup>5</sup>	93 <sup>97</sup>	5	16 23 31 <sup>59</sup>	16 39 43 <sup>3</sup>	59 <sup>83</sup>
6	14 46 22 <sup>09</sup>	10 33 48 <sup>3</sup>	93 <sup>37</sup>	6	16 25 36 <sup>71</sup>	16 45 42 <sup>3</sup>	59 <sup>02</sup>
7	14 48 25 <sup>45</sup>	10 43 8 <sup>5</sup>	92 <sup>78</sup>	7	16 27 41 <sup>89</sup>	16 51 36 <sup>4</sup>	58 <sup>18</sup>
8	14 50 28 <sup>81</sup>	10 52 25 <sup>2</sup>	92 <sup>18</sup>	8	16 29 47 <sup>12</sup>	16 57 25 <sup>5</sup>	57 <sup>37</sup>
9	14 52 32 <sup>18</sup>	11 1 38 <sup>3</sup>	91 <sup>57</sup>	9	16 31 52 <sup>40</sup>	17 3 9 <sup>7</sup>	56 <sup>53</sup>
10	14 54 35 <sup>56</sup>	11 10 47 <sup>7</sup>	90 <sup>97</sup>	10	16 33 57 <sup>74</sup>	17 8 48 <sup>9</sup>	55 <sup>68</sup>
11	14 56 38 <sup>95</sup>	11 19 53 <sup>5</sup>	90 <sup>33</sup>	11	16 36 3 <sup>13</sup>	17 14 23 <sup>0</sup>	54 <sup>85</sup>
12	14 58 42 <sup>36</sup>	11 28 55 <sup>5</sup>	89 <sup>72</sup>	12	16 38 8 <sup>58</sup>	17 19 52 <sup>1</sup>	54 <sup>00</sup>
13	15 0 45 <sup>78</sup>	11 37 53 <sup>8</sup>	89 <sup>08</sup>	13	16 40 14 <sup>08</sup>	17 25 16 <sup>1</sup>	53 <sup>17</sup>
14	15 2 49 <sup>22</sup>	11 46 48 <sup>3</sup>	88 <sup>47</sup>	14	16 42 19 <sup>63</sup>	17 30 35 <sup>1</sup>	52 <sup>30</sup>
15	15 4 52 <sup>68</sup>	11 55 39 <sup>1</sup>	87 <sup>80</sup>	15	16 44 25 <sup>23</sup>	17 35 49 <sup>0</sup>	51 <sup>45</sup>
16	15 6 56 <sup>17</sup>	12 4 25 <sup>9</sup>	87 <sup>18</sup>	16	16 46 30 <sup>88</sup>	17 40 57 <sup>7</sup>	50 <sup>60</sup>
17	15 8 59 <sup>67</sup>	12 13 9 <sup>0</sup>	86 <sup>52</sup>	17	16 48 36 <sup>58</sup>	17 46 1 <sup>3</sup>	49 <sup>73</sup>
18	15 11 3 <sup>20</sup>	12 21 48 <sup>1</sup>	85 <sup>85</sup>	18	16 50 42 <sup>33</sup>	17 50 59 <sup>7</sup>	48 <sup>87</sup>
19	15 13 6 <sup>76</sup>	12 30 23 <sup>2</sup>	85 <sup>20</sup>	19	16 52 48 <sup>14</sup>	17 55 52 <sup>9</sup>	48 <sup>00</sup>
20	15 15 10 <sup>34</sup>	12 38 54 <sup>4</sup>	84 <sup>53</sup>	20	16 54 53 <sup>99</sup>	18 0 40 <sup>9</sup>	47 <sup>13</sup>
21	15 17 13 <sup>95</sup>	12 47 21 <sup>6</sup>	83 <sup>87</sup>	21	16 56 59 <sup>89</sup>	18 5 23 <sup>7</sup>	46 <sup>27</sup>
22	15 19 17 <sup>59</sup>	12 55 44 <sup>8</sup>	83 <sup>18</sup>	22	16 59 5 <sup>83</sup>	18 10 1 <sup>3</sup>	45 <sup>38</sup>
23	15 21 21 <sup>27</sup>	S. 13 4 3 <sup>9</sup>	82 <sup>50</sup>	23	17 1 11 <sup>83</sup>	S. 18 14 33 <sup>6</sup>	44 <sup>50</sup>
<i>THURSDAY 18.</i>				<i>SATURDAY 20.</i>			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	15 23 24 <sup>98</sup>	S. 13 12 18 <sup>9</sup>	81 <sup>82</sup>	0	17 3 17 <sup>87</sup>	S. 18 19 0 <sup>6</sup>	43 <sup>62</sup>
1	15 25 28 <sup>72</sup>	13 20 29 <sup>8</sup>	81 <sup>12</sup>	1	17 5 23 <sup>96</sup>	18 23 22 <sup>3</sup>	42 <sup>73</sup>
2	15 27 32 <sup>50</sup>	13 28 36 <sup>5</sup>	80 <sup>43</sup>	2	17 7 30 <sup>09</sup>	18 27 38 <sup>7</sup>	41 <sup>88</sup>
3	15 29 36 <sup>32</sup>	13 36 39 <sup>1</sup>	79 <sup>72</sup>	3	17 9 36 <sup>26</sup>	18 31 49 <sup>8</sup>	40 <sup>95</sup>
4	15 31 40 <sup>18</sup>	13 44 37 <sup>4</sup>	79 <sup>02</sup>	4	17 11 42 <sup>48</sup>	18 35 55 <sup>5</sup>	40 <sup>07</sup>
5	15 33 44 <sup>07</sup>	13 52 31 <sup>5</sup>	78 <sup>30</sup>	5	17 13 48 <sup>74</sup>	18 39 55 <sup>9</sup>	39 <sup>18</sup>
6	15 35 48 <sup>01</sup>	14 0 21 <sup>3</sup>	77 <sup>58</sup>	6	17 15 55 <sup>04</sup>	18 43 50 <sup>8</sup>	38 <sup>27</sup>
7	15 37 51 <sup>98</sup>	14 8 6 <sup>8</sup>	76 <sup>87</sup>	7	17 18 1 <sup>38</sup>	18 47 40 <sup>4</sup>	37 <sup>37</sup>
8	15 39 56 <sup>00</sup>	14 15 48 <sup>0</sup>	76 <sup>15</sup>	8	17 20 7 <sup>76</sup>	18 51 24 <sup>6</sup>	36 <sup>47</sup>
9	15 42 0 <sup>07</sup>	14 23 24 <sup>9</sup>	75 <sup>40</sup>	9	17 22 14 <sup>17</sup>	18 55 3 <sup>4</sup>	35 <sup>55</sup>
10	15 44 4 <sup>18</sup>	14 30 57 <sup>3</sup>	74 <sup>67</sup>	10	17 24 20 <sup>62</sup>	18 58 36 <sup>7</sup>	34 <sup>65</sup>
11	15 46 8 <sup>33</sup>	14 38 25 <sup>3</sup>	73 <sup>93</sup>	11	17 26 27 <sup>11</sup>	19 2 4 <sup>6</sup>	33 <sup>73</sup>
12	15 48 12 <sup>53</sup>	14 45 48 <sup>9</sup>	73 <sup>18</sup>	12	17 28 33 <sup>63</sup>	19 5 27 <sup>0</sup>	32 <sup>83</sup>
13	15 50 16 <sup>78</sup>	14 53 8 <sup>0</sup>	72 <sup>43</sup>	13	17 30 40 <sup>19</sup>	19 8 44 <sup>0</sup>	31 <sup>90</sup>
14	15 52 21 <sup>07</sup>	15 0 22 <sup>6</sup>	71 <sup>68</sup>	14	17 32 46 <sup>77</sup>	19 11 55 <sup>4</sup>	31 <sup>00</sup>
15	15 54 25 <sup>42</sup>	15 7 32 <sup>7</sup>	70 <sup>92</sup>	15	17 34 53 <sup>38</sup>	19 15 1 <sup>4</sup>	30 <sup>08</sup>
16	15 56 29 <sup>81</sup>	15 14 38 <sup>2</sup>	70 <sup>15</sup>	16	17 37 0 <sup>03</sup>	19 18 1 <sup>9</sup>	29 <sup>15</sup>
17	15 58 34 <sup>25</sup>	15 21 39 <sup>1</sup>	69 <sup>38</sup>	17	17 39 6 <sup>70</sup>	19 20 56 <sup>8</sup>	28 <sup>23</sup>
18	16 0 38 <sup>74</sup>	15 28 35 <sup>4</sup>	68 <sup>62</sup>	18	17 41 13 <sup>39</sup>	19 23 46 <sup>2</sup>	27 <sup>32</sup>
19	16 2 43 <sup>28</sup>	15 35 27 <sup>1</sup>	67 <sup>83</sup>	19	17 43 20 <sup>11</sup>	19 26 30 <sup>1</sup>	26 <sup>38</sup>
20	16 4 47 <sup>88</sup>	15 42 14 <sup>1</sup>	67 <sup>07</sup>	20	17 45 26 <sup>86</sup>	19 29 8 <sup>4</sup>	25 <sup>47</sup>
21	16 6 52 <sup>52</sup>	15 48 56 <sup>5</sup>	66 <sup>27</sup>	21	17 47 33 <sup>63</sup>	19 31 41 <sup>2</sup>	24 <sup>53</sup>
22	16 8 57 <sup>22</sup>	15 55 34 <sup>1</sup>	65 <sup>48</sup>	22	17 49 40 <sup>42</sup>	19 34 8 <sup>4</sup>	23 <sup>60</sup>
23	16 11 1 <sup>97</sup>	16 2 7 <sup>0</sup>	64 <sup>68</sup>	23	17 51 47 <sup>23</sup>	19 36 30 <sup>0</sup>	22 <sup>67</sup>
24	16 13 6 <sup>77</sup>	S. 16 8 35 <sup>1</sup>		24	17 53 54 <sup>05</sup>	S. 19 38 46 <sup>0</sup>	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 21.				TUESDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	17 53 54.05	S. 19 38 46.0	21.73	0	19 35 7.22	S. 19 37 20.0	23.00
1	17 56 0.89	19 40 56.4	20.82	1	19 37 12.69	19 35 2.0	23.92
2	17 58 7.75	19 43 1.3	19.87	2	19 39 18.09	19 32 38.5	24.80
3	18 0 14.61	19 45 0.5	18.93	3	19 41 23.41	19 30 9.7	25.70
4	18 2 21.49	19 46 54.1	18.00	4	19 43 28.66	19 27 35.5	26.60
5	18 4 28.38	19 48 42.1	17.05	5	19 45 33.83	19 24 55.9	27.48
6	18 6 35.28	19 50 24.4	16.12	6	19 47 38.92	19 22 11.0	28.37
7	18 8 42.18	19 52 1.1	15.18	7	19 49 43.93	19 19 20.8	29.25
8	18 10 49.08	19 53 32.2	14.25	8	19 51 48.86	19 16 25.3	30.13
9	18 12 55.99	19 54 57.7	13.30	9	19 53 53.70	19 13 24.5	31.02
10	18 15 2.90	19 56 17.5	12.35	10	19 55 58.47	19 10 18.4	31.88
11	18 17 9.81	19 57 31.6	11.42	11	19 58 3.14	19 7 7.1	32.75
12	18 19 16.71	19 58 40.1	10.47	12	20 0 7.73	19 3 50.6	33.63
13	18 21 23.61	19 59 42.9	9.53	13	20 2 12.23	19 0 28.8	34.48
14	18 23 30.50	20 0 40.1	8.58	14	20 4 16.64	18 57 1.9	35.35
15	18 25 37.38	20 1 31.6	7.65	15	20 6 20.95	18 53 29.8	36.22
16	18 27 44.25	20 2 17.5	6.70	16	20 8 25.18	18 49 52.5	37.07
17	18 29 51.11	20 2 57.7	5.75	17	20 10 29.31	18 46 10.1	37.92
18	18 31 57.95	20 3 32.2	4.82	18	20 12 33.34	18 42 22.6	38.77
19	18 34 4.78	20 4 1.1	3.87	19	20 14 37.28	18 38 30.0	39.60
20	18 36 11.58	20 4 24.3	2.93	20	20 16 41.12	18 34 32.4	40.45
21	18 38 18.37	20 4 41.9	1.98	21	20 18 44.87	18 30 29.7	41.28
22	18 40 25.14	20 4 53.8	1.05	22	20 20 48.51	18 26 22.0	42.12
23	18 42 31.88	S. 20 5 0.1	0.12	23	20 22 52.06	S. 18 22 9.3	42.93
MONDAY 22.				WEDNESDAY 24.			
0	18 44 38.60	S. 20 5 0.8	0.83	0	20 24 55.50	S. 18 17 51.7	43.77
1	18 46 45.29	20 4 55.8	1.77	1	20 26 58.84	18 13 29.1	44.58
2	18 48 51.95	20 4 45.2	2.70	2	20 29 2.08	18 9 1.6	45.40
3	18 50 58.58	20 4 29.0	3.65	3	20 31 5.22	18 4 29.2	46.22
4	18 53 5.17	20 4 7.1	4.58	4	20 33 8.25	17 59 51.9	47.02
5	18 55 11.73	20 3 39.6	5.52	5	20 35 11.18	17 55 9.8	47.83
6	18 57 18.26	20 3 6.5	6.45	6	20 37 14.00	17 50 22.8	48.62
7	18 59 24.74	20 2 27.8	7.38	7	20 39 16.71	17 45 31.1	49.42
8	19 1 31.18	20 1 43.5	8.32	8	20 41 19.31	17 40 34.6	50.22
9	19 3 37.58	20 0 53.6	9.25	9	20 43 21.81	17 35 33.3	51.00
10	19 5 43.94	19 59 58.1	10.18	10	20 45 24.20	17 30 27.3	51.78
11	19 7 50.25	19 58 57.0	11.10	11	20 47 26.48	17 25 16.4	-
12	19 9 56.51	19 57 50.4	12.03	12	20 49 28.65	17 20	-
13	19 12 2.72	19 56 38.2	12.97	13	20 51 30.71	17 14	-
14	19 14 8.88	19 55 20.4	13.88	14	20 53 32.66	17	-
15	19 16 14.98	19 53 57.1	14.80	15	20 55 34.49	17	-
16	19 18 21.03	19 52 28.3	15.72	16	20 57 36.22	16	-
17	19 20 27.03	19 50 54.0	16.65	17	20 59 37.83	16	-
18	19 22 32.96	19 49 14.1	17.55	18	21 1 39.33	16	-
19	19 24 38.83	19 47 28.8	18.48	19	21 3 40.72	16	-
20	19 26 44.64	19 45 37.9	19.38	20	21 5 42.00	16	-
21	19 28 50.39	19 43 41.6	20.30	21	21 7 43.17	16	-
22	19 30 56.07	19 41 39.8	21.20	22	21 9 44.22	16	-
23	19 33 1.68	19 39 32.6	22.10	23	21 11 45.16	16	-
24	19 35 7.22	S. 19 37 20.0	-	24	21 13 45.99	S.	-



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 25.				SATURDAY 27.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	21 13 45.99	S. 16 11 3.5	62.23	0	22 48 23.95	S. 10 1 14.5	90.23
1	21 15 46.71	16 4 50.1	62.95	1	22 50 20.12	9 52 12.5	90.74
2	21 17 47.31	15 58 32.4	63.67	2	22 52 16.23	9 43 7.8	91.25
3	21 19 47.80	15 52 10.4	64.35	3	22 54 12.28	9 34 0.5	91.67
4	21 21 48.19	15 45 44.3	65.05	4	22 56 8.28	9 24 50.5	92.03
5	21 23 48.46	15 39 14.0	65.75	5	22 58 4.21	9 15 38.0	92.34
6	21 25 48.61	15 32 39.5	66.42	6	23 0 0.10	9 6 22.9	92.59
7	21 27 48.66	15 26 1.0	67.12	7	23 1 55.93	8 57 5.3	93.24
8	21 29 48.60	15 19 18.3	67.78	8	23 3 51.71	8 47 45.2	93.77
9	21 31 48.42	15 12 31.6	68.45	9	23 5 47.45	8 38 22.6	94.17
10	21 33 48.14	15 5 40.9	69.12	10	23 7 43.14	8 28 57.6	94.53
11	21 35 47.74	14 58 46.2	69.78	11	23 9 38.78	8 19 30.3	94.75
12	21 37 47.24	14 51 47.5	70.43	12	23 11 34.39	8 10 0.6	95.33
13	21 39 46.63	14 44 44.9	71.08	13	23 13 29.96	8 0 28.6	95.77
14	21 41 45.91	14 37 38.4	71.73	14	23 15 25.49	7 50 54.3	96.00
15	21 43 45.08	14 30 28.0	72.35	15	23 17 20.99	7 41 17.8	96.44
16	21 45 44.15	14 23 13.9	73.00	16	23 19 16.46	7 31 39.1	96.78
17	21 47 43.11	14 15 55.9	73.63	17	23 21 11.89	7 21 58.3	97.11
18	21 49 41.96	14 8 34.1	74.25	18	23 23 7.30	7 12 15.3	97.53
19	21 51 40.71	14 1 8.6	74.87	19	23 25 2.68	7 2 30.2	97.78
20	21 53 39.36	13 53 39.4	75.47	20	23 26 58.04	6 52 43.0	98.23
21	21 55 37.90	13 46 6.6	76.08	21	23 28 53.38	6 42 53.8	98.53
22	21 57 36.35	13 38 30.1	76.68	22	23 30 48.71	6 33 2.7	98.78
23	21 59 34.69	S. 13 30 50.0	77.28	23	23 32 44.02	S. 6 23 9.5	99.11
FRIDAY 26.				SUNDAY 28.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	22 1 32.93	S. 13 23 6.3	77.87	0	23 34 39.31	S. 6 13 14.5	99.74
1	22 3 31.07	13 15 19.1	78.45	1	23 36 34.60	6 3 17.6	99.78
2	22 5 29.11	13 7 28.4	79.03	2	23 38 29.88	5 53 18.8	100.11
3	22 7 27.06	12 59 34.2	79.60	3	23 40 25.15	5 43 18.2	100.44
4	22 9 24.92	12 51 36.6	80.18	4	23 42 20.42	5 33 15.8	100.66
5	22 11 22.68	12 43 35.5	80.73	5	23 44 15.69	5 23 11.7	100.99
6	22 13 20.34	12 35 31.1	81.28	6	23 46 10.97	5 13 5.9	101.22
7	22 15 17.92	12 27 23.4	81.83	7	23 48 6.25	5 2 58.5	101.55
8	22 17 15.40	12 19 12.4	82.38	8	23 50 1.54	4 52 49.4	101.77
9	22 19 12.79	12 10 58.1	82.93	9	23 51 56.84	4 42 38.7	102.01
10	22 21 10.09	12 2 40.5	83.45	10	23 53 52.16	4 32 26.4	102.22
11	22 23 7.31	11 54 19.8	83.98	11	23 55 47.50	4 22 12.7	102.53
12	22 25 4.45	11 45 55.9	84.50	12	23 57 42.85	4 11 57.4	102.77
13	22 27 1.50	11 37 28.9	85.02	13	23 59 38.23	4 1 40.7	103.03
14	22 28 58.46	11 28 58.8	85.53	14	0 1 33.63	3 51 22.6	103.21
15	22 30 55.35	11 20 25.6	86.05	15	0 3 29.06	3 41 3.1	103.47
16	22 32 52.15	11 11 49.3	86.53	16	0 5 24.52	3 30 42.3	103.61
17	22 34 48.88	11 3 10.1	87.03	17	0 7 20.02	3 20 20.2	103.99
18	22 36 45.53	10 54 27.9	87.52	18	0 9 15.56	3 9 56.8	104.11
19	22 38 42.11	10 45 42.8	88.00	19	0 11 11.13	2 59 32.2	104.73
20	22 40 38.61	10 36 54.8	88.47	20	0 13 6.75	2 49 6.4	104.44
21	22 42 35.05	10 28 4.0	88.95	21	0 15 2.41	2 38 39.5	104.61
22	22 44 31.42	10 19 10.3	89.42	22	0 16 58.12	2 28 11.4	104.82
23	22 46 27.72	10 10 13.8	89.88	23	0 18 53.89	2 17 42.3	105.03
24	22 48 23.95	S. 10 1 14.5		24	0 20 49.71	S. 2 7 12.1	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 29.				WEDNESDAY 31.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	0 20 49.71	S. 2 7 12.1	105.20	0	1 55 37.58	N. 6 24 0.3	104.98
1	0 22 45.59	1 56 40.9	105.35	1	1 57 40.13	6 34 30.2	104.80
2	0 24 41.53	1 46 8.8	105.52	2	1 59 42.90	6 44 59.0	104.60
3	0 26 37.53	1 35 35.7	105.65	3	2 1 45.90	6 55 26.6	104.37
4	0 28 33.61	1 25 1.8	105.80	4	2 3 49.13	7 5 52.8	104.17
5	0 30 29.75	1 14 27.0	105.93	5	2 5 52.59	7 16 17.8	103.93
6	0 32 25.97	1 3 51.4	106.07	6	2 7 56.29	7 26 41.4	103.68
7	0 34 22.26	0 53 15.0	106.17	7	2 10 0.23	7 37 3.5	103.45
8	0 36 18.64	0 42 38.0	106.30	8	2 12 4.41	7 47 24.2	103.18
9	0 38 15.10	0 32 0.2	106.40	9	2 14 8.83	7 57 43.3	102.92
10	0 40 11.64	0 21 21.8	106.52	10	2 16 13.51	8 8 0.8	102.63
11	0 42 8.28	0 10 42.7	106.60	11	2 18 18.44	8 18 16.6	102.35
12	0 44 5.01	S. 0 0 3.1	106.68	12	2 20 23.62	8 28 30.7	102.05
13	0 46 1.83	N. 0 10 37.0	106.77	13	2 22 29.06	8 38 43.0	101.77
14	0 47 58.76	0 21 17.6	106.85	14	2 24 34.77	8 48 53.6	101.43
15	0 49 55.78	0 31 58.7	106.92	15	2 26 40.74	8 59 2.2	101.12
16	0 51 52.92	0 42 40.2	106.97	16	2 28 46.98	9 9 8.9	100.78
17	0 53 50.16	0 53 22.0	107.02	17	2 30 53.50	9 19 13.6	100.43
18	0 55 47.51	1 4 4.1	107.08	18	2 33 0.28	9 29 16.2	100.07
19	0 57 44.99	1 14 46.6	107.10	19	2 35 7.35	9 39 16.6	99.72
20	0 59 42.58	1 25 29.2	107.15	20	2 37 14.69	9 49 14.9	99.35
21	1 1 40.29	1 36 12.1	107.17	21	2 39 22.32	9 59 11.0	98.97
22	1 3 38.14	1 46 55.1	107.18	22	2 41 30.24	10 9 4.8	98.57
23	1 5 36.11	N. 1 57 38.2	107.20	23	2 43 38.45	N. 10 18 56.2	98.15
TUESDAY 30.				THURSDAY, AUG. 1.			
0	1 7 34.21	N. 2 8 21.4	107.20	0	2 45 46.95	N. 10 28 45.1	
1	1 9 32.45	2 19 4.6	107.20				
2	1 11 30.84	2 29 47.8	107.18				
3	1 13 29.36	2 40 30.9	107.17				
4	1 15 28.03	2 51 13.9	107.13				
5	1 17 26.85	3 1 56.7	107.12				
6	1 19 25.83	3 12 39.4	107.07				
7	1 21 24.96	3 23 21.8	107.02				
8	1 23 24.25	3 34 3.9	106.97				
9	1 25 23.71	3 44 45.7	106.90				
10	1 27 23.34	3 55 27.1	106.83				
11	1 29 23.13	4 6 8.1	106.75				
12	1 31 23.10	4 16 48.6	106.67				
13	1 33 23.25	4 27 28.6	106.57				
14	1 35 23.57	4 38 8.0	106.47				
15	1 37 24.09	4 48 46.8	106.37				
16	1 39 24.78	4 59 25.0	106.23				
17	1 41 25.68	5 10 2.4	106.12				
18	1 43 26.76	5 20 39.1	105.97				
19	1 45 28.05	5 31 14.9	105.83				
20	1 47 29.54	5 41 49.9	105.68				
21	1 49 31.23	5 52 24.0	105.52				
22	1 51 33.13	6 2 57.1	105.35				
23	1 53 35.25	6 13 29.2	105.18				
24	1 55 37.58	N. 6 24 0.3					

## PHASES OF THE MOON.

- ☾ Last Quarter - - - <sup>d h m</sup> 2  
 ● New Moon - - -  
 ☽ First Quarter  
 ○ Full Moon  
 ☾ Last Quarter

☾ Per

☾ Ap



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	
1	$\alpha$ Aquilæ W.	62 4 16	3608	63 22 42	3577	64 41 41	3548	66 1 12	
	$\alpha$ Arietis E.	42 39 43	3266	41 14 52	3278	39 50 15	3291	38 25 53	
	Aldebaran E.	72 36 14	2909	71 4 6	2898	69 31 44	2886	67 59 7	
	Sun E.	104 19 30	3265	102 54 38	3253	101 29 32	3241	100 4 11	
2	$\alpha$ Aquilæ W.	72 46 11	3394	74 8 35	3370	75 31 26	3347	76 54 43	
	Fomalhaut W.	38 26 35	3525	39 46 32	3464	41 7 36	3408	42 29 43	
	Aldebaran E.	60 11 59	2808	58 37 41	2793	57 3 4	2779	55 28 8	
	Sun E.	92 53 19	3155	91 26 16	3140	89 58 55	3124	88 31 14	
3	$\alpha$ Aquilæ W.	83 57 25	3220	85 23 10	3202	86 49 17	3183	88 15 46	
	Fomalhaut W.	49 34 11	3138	51 1 34	3101	52 29 42	3066	53 58 33	
	$\alpha$ Pegasi W.	37 5 11	3755	38 21 0	3663	39 38 27	3579	40 57 24	
	Aldebaran E.	47 28 23	2684	45 51 22	2667	44 13 58	2650	42 36 11	
	Sun E.	81 7 42	3021	79 37 55	3003	78 7 46	2984	76 37 13	
4	Fomalhaut W.	61 32 59	2877	63 5 47	2850	64 39 10	2822	66 13 9	
	$\alpha$ Pegasi W.	47 51 41	3194	49 17 57	3143	50 45 14	3096	52 13 28	
	Aldebaran E.	34 21 20	2544	32 41 8	2526	31 0 31	2507	29 19 28	
	Sun E.	68 58 34	2870	67 25 37	2850	65 52 14	2830	64 18 25	
5	Fomalhaut W.	74 11 32	2672	75 48 49	2650	77 26 36	2628	79 4 53	
	$\alpha$ Pegasi W.	59 47 39	2859	61 20 51	2825	62 54 47	2792	64 29 25	
	Saturn W.	26 34 11	2427	28 17 8	2406	30 0 34	2386	31 44 29	
	$\alpha$ Arietis W.	18 51 31	4479	19 55 42	4131	21 5 14	3851	22 19 24	
	Sun E.	56 22 54	2711	54 46 29	2692	53 9 38	2672	51 32 21	
6	Fomalhaut W.	87 23 23	2509	89 4 24	2492	90 45 48	2475	92 27 36	
	$\alpha$ Pegasi W.	72 32 9	2627	74 10 27	2603	75 49 18	2581	77 28 39	
	Saturn W.	40 30 58	2273	42 17 37	2256	44 4 42	2239	45 52 12	
	$\alpha$ Arietis W.	29 20 30	2935	30 52 4	2850	32 25 27	2776	34 0 27	
	Sun E.	43 19 29	2560	41 39 39	2543	39 59 25	2525	38 18 46	
7	Saturn W.	54 55 49	2144	56 45 41	2130	58 35 54	2117	60 26 28	
	$\alpha$ Arietis W.	42 14 47	2468	43 56 45	2431	45 39 35	2400	47 23 10	
	Sun E.	29 49 59	2433	28 7 12	2421	26 24 7	2410	24 40 46	
11	Sun W.	26 53 33	2333	28 38 45	2340	30 23 46	2349	32 8 34	
	Jupiter E.	32 42 23	2083	30 50 57	2092	28 59 45	2103	27 8 51	
	Spica $\pi$ E.	66 7 40	2069	64 15 53	2079	62 24 21	2090	60 33 7	
12	Sun W.	40 48 46	2417	42 31 56	2431	44 14 46	2445	45 57 16	
	Spica $\pi$ E.	51 21 47	2173	49 32 38	2188	47 43 53	2206	45 55 34	
	Antares E.	97 16 3	2179	95 27 3	2191	93 38 22	2205	91 50 2	
13	Sun W.	54 24 23	2540	56 4 40	2556	57 44 35	2574	59 24 6	
	Venus W.	20 48 0	2614	22 26 36	2632	24 4 48	2649	25 42 37	
	Spica $\pi$ E.	37 1 6	2328	35 15 47	2353	33 31 4	2379	31 46 59	
	Antares E.	82 53 50	2296	81 7 45	2313	79 22 5	2330	77 36 49	
14	Sun W.	67 35 38	2681	69 12 44	2699	70 49 25	2717	72 25 42	
	Venus W.	33 45 44	2757	35 21 9	2776	36 56 9	2793	38 30 46	
	Regulus W.	31 33 15	2371	33 17 32	2388	35 1 24	2404	36 44 53	
	Mars W.	24 12 11	2564	25 51 55	2583	27 31 14	2600	29 10 9	
	Antares E.	68 56 52	2438	67 14 11	2457	65 31 57	2475	63 50 9	



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>b</sup> .	P.L. of diff.	XVIII <sup>b</sup> .	P.L. of diff.	XXI <sup>b</sup> .	P.L. of diff.
		° ' "		° ' "		° ' "		° ' "	
1	α Aquilæ W.	67 21 13	3494	68 41 44	3467	70 2 45	3442	71 24 14	3417
	α Arietis E.	37 1 51	3328	35 38 12	3351	34 15 0	3381	32 52 22	3415
	Aldebaran E.	66 26 14	2862	64 53 6	2850	63 19 41	2835	61 45 59	2821
	SUN E.	98 38 34	3214	97 12 41	3199	95 46 31	3185	94 20 4	3170
2	α Aquilæ W.	78 18 26	3303	79 42 34	3282	81 7 7	3261	82 32 4	3241
	Fomalhaut W.	43 52 50	3308	45 16 52	3261	46 41 49	3219	48 7 36	3178
	Aldebaran E.	53 52 52	2748	52 17 16	2733	50 41 20	2717	49 5 2	2701
	SUN E.	87 3 12	3091	85 34 51	3074	84 6 10	3056	82 37 7	3039
3	α Aquilæ W.	89 42 37	3147	91 9 50	3130	92 37 23	3114	94 5 16	3098
	Fomalhaut W.	55 28 7	2999	56 58 21	2967	58 29 15	2936	60 0 48	2906
	α Pegasi W.	42 17 46	3431	43 39 27	3365	45 2 23	3305	46 26 29	3248
	Aldebaran E.	40 58 1	2615	39 19 27	2598	37 40 29	2580	36 1 7	2562
	SUN E.	75 6 18	2946	73 34 58	2928	72 3 15	2909	70 31 7	2889
4	Fomalhaut W.	67 47 43	2769	69 22 51	2744	70 58 32	2719	72 34 46	2695
	α Pegasi W.	53 42 37	3010	55 12 38	2969	56 43 30	2930	58 15 11	2893
	Aldebaran E.	27 38 0	2471	25 56 6	2452	24 13 45	2434	22 30 59	2415
	SUN E.	62 44 11	2791	61 9 31	2771	59 34 25	2751	57 58 53	2731
5	Fomalhaut W.	80 43 40	2585	82 22 55	2565	84 2 38	2546	85 42 48	2528
	α Pegasi W.	66 4 43	2733	67 40 39	2705	69 17 13	2677	70 54 24	2652
	Saturn W.	33 28 52	2348	35 13 42	2328	36 59 0	2309	38 44 46	2291
	α Arietis W.	23 37 32	3436	24 59 8	3279	26 23 44	3146	27 50 58	3033
	SUN E.	49 54 38	2634	48 16 29	2615	46 37 55	2596	44 58 55	2577
6	Fomalhaut W.	94 9 46	2445	95 52 17	2431	97 35 8	2418	99 18 17	2406
	α Pegasi W.	79 8 30	2540	80 48 48	2520	82 29 34	2502	84 10 44	2485
	Saturn W.	47 40 8	2205	49 28 28	2189	51 17 12	2174	53 6 19	2159
	α Arietis W.	35 36 54	2650	37 14 41	2598	38 53 39	2550	40 33 43	2507
	SUN E.	36 37 45	2492	34 56 20	2477	33 14 34	2462	31 32 27	2447
7	Saturn W.	62 17 21	2091	64 8 34	2080	66 0 4	2070	67 51 50	2059
	α Arietis W.	49 7 29	2342	50 52 27	2317	52 38 2	2293	54 24 11	2272
	SUN E.	22 57 10	2389	21 13 20	2383	19 29 21	2377	17 45 13	2375
11	SUN W.	33 53 9	2369	35 37 28	2380	37 21 31	2391	39 5 18	2405
	Jupiter E.	25 18 14	2127	23 27 56	2141	21 37 59	2155	19 48 24	217
	Spica ♀ E.	58 42 10	2114	56 51 33	2128	55 1 16	2142	53 11 21	
12	SUN W.	47 39 25	2475	49 21 13	2492	51 2 38	2507	52 43	
	Spica ♀ E.	44 7 42	2242	42 20 17	2263	40 33 23	2283	38 46	
	Antares E.	90 2 3	2234	88 14 26	2249	86 27 11	2264	84 4	
13	SUN W.	61 3 12	2609	62 41 55	2627	64 20 14	2648	(	
	Venus W.	27 20 2	2684	28 57 4	2702	30 33 41	2720	3	
	Spica ♀ E.	30 3 33	2437	28 20 51	2470	26 38 56	2507		
	Antares E.	75 51 58	2365	74 7 33	2382	72 23 33	2401		
14	SUN W.	74 1 35	2753	75 37 4	2772	77 12 9	2791		
	Venus W.	40 4 59	2831	41 38 47	2849	43 12 11			
	Regulus W.	38 27 58	2438	40 10 38	2455	41 52 5			
	Mars W.	30 48 40	2635	32 26 47	2653	34 4			
	Antares E.	62 8 48	2514	60 27 54	2534	58 47			



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.		Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
			<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>
15	SUN	W.	80 21 9	2826	81 55 3	2843	83 28 35	2861	85 1 4
	Venus	W.	46 17 50	2904	47 50 4	2922	49 21 55	2940	50 53 2
	Regulus	W.	45 16 15	2506	46 57 20	2522	48 38 3	2539	50 18 2
	Mars	W.	37 18 44	2706	38 55 16	2723	40 31 25	2741	42 7 1
	Jupiter	W.	24 7 23	2568	25 47 2	2583	27 26 20	2600	29 5 1
	Antares	E.	55 27 58	2593	53 48 54	2614	52 10 18	2635	50 32 1
16	SUN	W.	92 41 56	2963	94 12 55	2980	95 43 33	2995	97 13 5
	Regulus	W.	58 34 28	2634	60 12 37	2649	61 50 26	2664	63 27 5
	Venus	W.	58 25 15	3044	59 54 33	3061	61 23 31	3077	62 52 9
	Mars	W.	50 0 29	2840	51 34 5	2857	53 7 19	2872	54 40 1
	Jupiter	W.	37 14 38	2692	38 51 29	2708	40 27 59	2723	42 4 9
	Antares	E.	42 28 50	2769	40 53 41	2793	39 19 4	2818	37 44 5
	α Aquilæ	E.	90 32 53	3167	89 6 4	3182	87 39 33	3198	86 13 2
17	SUN	W.	104 40 36	3087	106 9 2	3100	107 37 12	3114	109 5 4
	Regulus	W.	71 30 30	2748	73 6 6	2760	74 41 26	2774	76 16 2
	Venus	W.	70 10 34	3169	71 37 20	3183	73 3 50	3198	74 30 4
	Mars	W.	62 20 0	2960	63 51 3	2974	65 21 48	2988	66 52 1
	Jupiter	W.	50 0 17	2806	51 34 37	2819	53 8 40	2833	54 42 2
	Antares	E.	30 3 44	3004	28 33 36	3044	27 4 18	3089	25 35 5
	α Aquilæ	E.	79 7 31	3306	77 43 26	3326	76 19 44	3346	74 56 2
18	SUN	W.	116 20 31	3191	117 46 51	3201	119 12 59	3213	120 38 5
	Venus	W.	81 37 10	3274	83 1 52	3286	84 26 20	3298	85 50 3
	Mars	W.	74 20 41	3061	75 49 38	3073	77 18 20	3083	78 46 5
	Jupiter	W.	62 27 18	2903	63 59 33	2914	65 31 34	2925	67 3 2
	Spica ♀	W.	30 58 12	2959	32 29 16	2961	34 0 18	2962	35 31 18
	α Aquilæ	E.	68 6 12	3483	66 45 29	3509	65 25 15	3536	64 5 3
19	SUN	W.	127 45 17	3273	129 10 0	3282	130 34 32	3291	131 58 5
	Venus	W.	92 48 43	3359	94 11 46	3367	95 34 40	3377	96 57 23
	Mars	W.	86 6 10	3143	87 33 28	3152	89 0 35	3160	90 27 32
	Jupiter	W.	74 39 12	2981	76 9 48	2989	77 40 14	2998	79 10 29
	Spica ♀	W.	43 5 10	2986	44 35 40	2991	46 6 4	2996	47 36 22
	α Aquilæ	E.	57 34 56	3726	56 18 36	3764	55 2 56	3803	53 47 57
	Fomalhaut E.		89 24 58	3177	87 58 21	3186	86 31 55	3194	85 5 39
20	Venus	W.	103 48 41	3423	105 10 32	3430	106 32 15	3437	107 53 50
	Mars	W.	97 39 57	3204	99 6 1	3211	100 31 57	3218	101 57 45
	Jupiter	W.	86 39 25	3041	88 8 47	3048	89 38 1	3053	91 7 8
	Spica ♀	W.	55 6 22	3025	56 36 4	3029	58 5 41	3034	59 35 12
	α Aquilæ	E.	47 44 50	4106	46 34 54	4171	45 26 0	4240	44 18 12
	Fomalhaut E.		77 57 0	3249	76 31 49	3259	75 6 49	3268	73 42 0
	α Pegasi	E.	93 6 25	3323	91 42 40	3328	90 19 1	3334	88 55 29
21	Mars	W.	109 5 7	3249	110 30 18	3254	111 55 23	3259	113 20 23
	Jupiter	W.	98 31 1	3084	99 59 30	3089	101 27 53	3092	102 56 12
	Spica ♀	W.	67 1 31	3057	68 30 33	3061	69 59 31	3064	71 28 25
	Antares	W.	22 28 32	3431	23 50 13	3490	25 12 41	3556	26 35 48
	Fomalhaut E.		66 40 56	3331	65 17 20	3344	63 53 59	3355	62 30 51
	α Pegasi	E.	81 59 37	3373	80 36 50	3379	79 14 10	3388	77 51 40
	Saturn	E.	112 24 47	3033	110 55 15	3036	109 25 47	3039	107 56 23



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>	
15	SUN W.	86 34 30	2396	88 6 54	2913	89 38 56	2930	91 10 37	2947
	Venus W.	52 24 29	2975	53 55 13	2993	55 25 35	3010	56 55 36	3027
	Regulus W.	51 58 19	2571	53 37 54	2587	55 17 7	2603	56 55 58	2618
	Mars W.	43 42 35	2775	45 17 36	2792	46 52 15	2808	48 26 33	2825
	Jupiter W.	30 43 51	2631	32 22 4	2646	33 59 56	2661	35 37 28	2677
	Antares E.	48 54 32	2678	47 17 22	2700	45 40 42	2722	44 4 31	2744
16	SUN W.	98 43 50	3026	100 13 30	3043	101 42 50	3057	103 11 52	3072
	Regulus W.	65 5 3	2693	66 41 53	2708	68 18 23	2720	69 54 36	2735
	Venus W.	64 20 28	3109	65 48 27	3124	67 16 8	3139	68 43 30	3154
	Mars W.	56 12 49	2902	57 45 5	2917	59 17 2	2932	60 48 40	2946
	Jupiter W.	43 40 0	2751	45 15 32	2766	46 50 45	2779	48 25 40	2793
	Antares E.	36 11 28	2873	34 38 34	2901	33 6 16	2933	31 34 39	2966
	α Aquilæ E.	84 47 29	3232	83 21 58	3249	81 56 47	3268	80 31 58	3287
17	SUN W.	110 32 40	3140	112 0 1	3154	113 27 5	3166	114 53 55	3178
	Regulus W.	77 51 15	2798	79 25 45	2810	81 0 0	2822	82 33 59	2832
	Venus W.	75 55 59	3225	77 21 39	3237	78 47 4	3249	80 12 15	3263
	Mars W.	68 22 28	3014	69 52 24	3026	71 22 5	3039	72 51 30	3050
	Jupiter W.	56 15 55	2858	57 49 8	2869	59 22 6	2880	60 54 50	2893
	Antares E.	24 8 35	3199	22 42 25	3267	21 17 35	3348	19 54 19	3446
	α Aquilæ E.	73 33 32	3389	72 11 3	3411	70 48 59	3435	69 27 22	3459
18	SUN W.	122 4 34	3234	123 30 3	3245	124 55 19	3254	126 20 24	3264
	Venus W.	87 14 36	3319	88 38 25	3329	90 2 3	3340	91 25 28	3349
	Mars W.	80 15 6	3105	81 43 10	3115	83 11 2	3124	84 38 42	3134
	Jupiter W.	68 34 56	2945	70 6 18	2955	71 37 27	2963	73 8 26	2974
	Spica ♀ W.	37 2 14	2969	38 33 6	2973	40 3 53	2977	41 34 34	2981
	α Aquilæ E.	62 46 17	3594	61 27 36	3624	60 9 28	3656	58 51 54	3690
19	SUN W.	133 23 6	3307	134 47 9	3316	136 11 2	3323	137 34 47	3330
	Venus W.	98 19 57	3393	99 42 21	3401	101 4 36	3408	102 26 43	3416
	Mars W.	91 54 20	3177	93 20 57	3183	94 47 26	3191	96 13 46	3199
	Jupiter W.	80 40 34	3014	82 10 30	3021	83 40 17	3028	85 9 55	3035
	Spica ♀ W.	49 6 34	3006	50 36 40	3010	52 6 40	3015	53 36 34	3020
	α Aquilæ E.	52 33 42	3891	51 20 13	3939	50 7 33	3991	48 55 44	4046
	Fomalhaut E.	83 39 34	3212	82 13 39	3221	80 47 55	3231	78 22 22	3240
20	Venus W.	109 15 19	3448	110 36 41	3454	111 57 57	3461	113 18 47	3464
	Mars W.	103 23 26	3229	104 49 1	3235	106 14 29	3241	107 34 2	3245
	Jupiter W.	92 36 7	3065	94 5 0	3070	95 33 46	3076	96 52 37	3080
	Spica ♀ W.	61 4 38	3043	62 33 58	3045	64 3 14	3047	65 25 35	3054
	α Aquilæ E.	43 11 34	4399	42 6 12	4402	41 2 10	4404	39 55 46	4406
	Fomalhaut E.	72 17 23	3288	70 52 58	3292	69 28 45	3295	67 58 20	3298
	α Pegasi E.	87 32 4	3346	86 8 46	3350	84 45 36	3353	82 53 27	3356
21	Mars W.	114 45 19	3266	116 7 1	3270	117 34 2	3273	118 51 13	3276
	Jupiter W.	104 24 26	3101	105 4 1	3105	107 20 4	3108	108 36 15	3111
	Spica ♀ W.	72 57 15	3070	74 6 1	3073	75 54 4	3076	77 11 15	3079
	Antares W.	27 59 29	3303	29 8 1	3306	30 48 1	3309	31 6 11	3312
	Fomalhaut E.	61 7 58	3381	59 57 5	3384	58 46 1	3387	57 35 12	3390
	α Pegasi E.	76 29 18	3404	75 18 13	3407	73 56 4	3410	72 45 15	3413
	Saturn E.	106 27 5	3047	104 56 1	3050	103 44 1	3053	102 32 12	3056



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .
		° ' "		° ' "		° ' "		° ' "
22	Spica $\pi$ g W.	78 51 59	3080	80 20 33	3088	81 49 4	3086	83 17 31
	Antares W.	33 38 10	3238	35 3 34	3227	36 29 11	3217	37 55 0
	Fomalhaut E.	55 39 6	3442	54 17 37	3460	52 56 28	3478	51 35 39
	$\alpha$ Pegasi E.	71 1 28	3439	69 39 56	3450	68 18 36	3462	66 57 29
	Saturn E.	100 30 29	3059	99 1 29	3061	97 32 32	3064	96 3 38
23	Spica $\pi$ g W.	90 39 18	3095	92 7 34	3096	93 35 48	3096	95 4 2
	Antares W.	45 6 12	3179	46 32 46	3174	47 59 26	3171	49 26 10
	$\alpha$ Pegasi E.	60 15 14	3539	58 55 33	3555	57 36 11	3574	56 17 8
	Saturn E.	88 39 40	3074	87 10 58	3074	85 42 17	3075	84 13 37
24	Antares W.	56 40 55	3150	58 8 4	3148	59 35 15	3144	61 2 31
	$\alpha$ Pegasi E.	49 47 27	3710	48 30 51	3740	47 14 46	3772	45 59 15
	Saturn E.	76 50 27	3077	75 21 49	3077	73 53 11	3077	72 24 33
	$\alpha$ Arietis E.	91 14 20	3221	89 48 36	3221	88 22 52	3221	86 57 8
25	Antares W.	68 19 37	3129	69 47 12	3125	71 14 51	3122	72 42 34
	$\alpha$ Pegasi E.	39 52 10	4049	38 41 19	4115	37 31 32	4187	36 22 54
	Saturn E.	65 1 5	3070	63 32 19	3068	62 3 30	3067	60 34 40
	$\alpha$ Arietis E.	79 48 26	3220	78 22 41	3221	76 56 57	3220	75 31 12
26	Antares W.	80 2 6	3102	81 30 13	3098	82 58 25	3095	84 26 41
	Saturn E.	53 9 46	3052	51 40 38	3048	50 11 25	3045	48 42 8
	$\alpha$ Arietis E.	68 22 34	3224	66 56 53	3224	65 31 12	3225	64 5 32
	Aldebaran E.	99 45 19	3042	98 15 58	3040	96 46 33	3035	95 17 4
27	$\alpha$ Aquilæ W.	49 35 44	4009	50 47 15	3961	51 59 33	3917	53 12 36
	Saturn E.	41 14 35	3021	39 44 48	3016	38 14 55	3011	36 44 56
	$\alpha$ Arietis E.	56 57 40	3236	55 32 13	3239	54 6 50	3242	52 41 31
	Aldebaran E.	87 48 23	3009	86 18 21	3004	84 48 13	2998	83 17 58
28	$\alpha$ Aquilæ W.	59 27 36	3703	60 44 20	3674	62 1 35	3646	63 19 20
	Saturn E.	29 13 23	2978	27 42 43	2978	26 11 56	2967	24 41 2
	$\alpha$ Arietis E.	45 36 31	3282	44 11 58	3293	42 47 38	3305	41 23 32
	Aldebaran E.	75 44 50	2961	74 13 48	2952	72 42 35	2946	71 11 14
	Sun E.	133 10 34	3316	131 46 41	3308	130 22 39	3300	128 58 27
29	$\alpha$ Aquilæ W.	69 54 55	3501	71 15 18	3481	72 36 3	3461	73 57 11
	Fomalhaut W.	35 37 25	3724	36 53 47	3656	38 11 21	3594	39 30 2
	$\alpha$ Arietis E.	34 28 15	3438	33 6 41	3474	31 45 48	3519	30 25 45
	Aldebaran E.	63 31 46	2892	61 59 17	2883	60 26 36	2873	58 53 43
	Sun E.	121 54 46	3242	120 29 26	3232	119 3 55	3220	117 38 10
30	$\alpha$ Aquilæ W.	80 48 10	3351	82 11 22	3335	83 34 53	3319	84 58 42
	Fomalhaut W.	46 17 38	3312	47 41 36	3274	49 6 18	3239	50 31 41
	$\alpha$ Pegasi W.	34 24 23	4088	35 34 36	3978	36 46 37	3881	38 0 16
	Aldebaran E.	51 5 44	2805	49 31 23	2793	47 56 46	2781	46 21 53
	Sun E.	110 25 56	3148	108 58 44	3134	107 31 15	3121	106 3 31
31	$\alpha$ Aquilæ W.	92 2 11	3233	93 27 41	3220	94 53 27	3207	96 19 28
	Fomalhaut W.	57 48 0	3058	59 17 1	3031	60 46 35	3006	62 16 40
	$\alpha$ Pegasi W.	41 29 23	3447	45 50 46	3392	47 13 12	3340	48 36 37
	Aldebaran E.	38 23 2	2699	36 46 21	2684	35 9 19	2669	33 31 58
	Sun E.	98 40 23	3032	97 10 50	3016	95 40 57	3000	94 10 41



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
22	Spica $\pi$ g W.	84 45 57 3089	86 14 20 3091	87 42 41 3092	89 11 1 3094				
	Antares W.	39 20 59 3202	40 47 6 3195	42 13 21 3189	43 39 43 3183				
	Fomalhaut E.	50 15 14 3519	48 55 11 3544	47 35 35 3568	46 16 26 3596				
	$\alpha$ Pegasi E.	65 36 34 3484	64 15 52 3497	62 55 24 3510	61 35 11 3525				
	Saturn E.	94 34 46 3068	93 5 57 3069	91 37 9 3071	90 8 24 3072				
23	Spica $\pi$ g W.	96 32 14 3099	98 0 25 3100	99 28 35 3100	100 56 45 3101				
	Antares W.	50 52 59 3163	52 19 52 3159	53 46 50 3157	55 13 51 3154				
	$\alpha$ Pegasi E.	54 58 25 3612	53 40 4 3634	52 22 6 3657	51 4 33 3682				
	Saturn E.	82 44 58 3077	81 16 20 3077	79 47 42 3077	78 19 4 3078				
24	Antares W.	62 29 49 3139	63 57 11 3137	65 24 36 3134	66 52 5 3131				
	$\alpha$ Pegasi E.	44 44 21 3848	43 30 8 3891	42 16 39 3938	41 3 58 3991				
	Saturn E.	70 55 53 3075	69 27 13 3074	67 58 32 3073	66 29 49 3072				
	$\alpha$ Arietis E.	85 31 24 3220	84 5 39 3221	82 39 55 3220	81 14 10 3221				
25	Antares W.	74 10 20 3115	75 38 11 3113	77 6 5 3110	78 34 3 3105				
	$\alpha$ Pegasi E.	35 15 32 4360	34 9 34 4464	33 5 10 4580	32 2 28 4713				
	Saturn E.	59 5 47 3063	57 36 52 3060	56 7 53 3057	54 38 51 3055				
	$\alpha$ Arietis E.	74 5 28 3221	72 39 44 3221	71 14 0 3222	69 48 17 3222				
26	Antares W.	85 55 3 3087	87 23 29 3082	88 52 1 3078	90 20 38 3073				
	Saturn E.	47 12 47 3039	45 43 22 3034	44 13 51 3031	42 44 16 3026				
	$\alpha$ Arietis E.	62 39 53 3228	61 14 17 3229	59 48 42 3231	58 23 9 3234				
	Aldebaran E.	93 47 30 3027	92 17 51 3023	90 48 7 3019	89 18 18 3014				
27	$\alpha$ Aquilæ W.	54 26 20 3836	55 40 45 3800	56 55 47 3766	58 11 24 3733				
	Saturn E.	35 14 51 3002	33 44 40 2995	32 14 21 2990	30 43 56 2984				
	$\alpha$ Arietis E.	51 16 17 3252	49 51 9 3258	48 26 8 3265	47 1 15 3272				
	Aldebaran E.	81 47 36 2987	80 17 7 2980	78 46 29 2974	77 15 44 2967				
28	$\alpha$ Aquilæ W.	64 37 31 3593	65 56 16 3569	67 15 24 3546	68 34 57 3524				
	Saturn E.	23 10 0 2955	21 38 51 2950	20 7 36 2946	18 36 15 2942				
	$\alpha$ Arietis E.	39 59 43 3336	38 36 13 3356	37 13 6 3379	35 50 25 3406				
	Aldebaran E.	69 39 42 2929	68 8 0 2920	66 36 6 2912	65 4 2 2902				
	SUN E.	127 34 4 3282	126 9 32 3272	124 44 48 3263	123 19 53 3253				
29	$\alpha$ Aquilæ W.	75 18 41 3422	76 40 32 3403	78 2 45 3386	79 25 17 3368				
	Fomalhaut W.	40 49 45 3485	42 10 26 3438	43 32 0 3393	44 54 25 3351				
	$\alpha$ Arietis E.	29 6 39 3633	27 48 40 3708	26 32 1 3797	25 7 6 3906				
	Aldebaran E.	57 20 35 2852	55 47 14 2841	54 13 39 2820	53 1 18 2808				
	SUN E.	116 12 12 3198	114 46 0 3185	113 19 33 317	111 52 16 315				
30	$\alpha$ Aquilæ W.	86 22 50 3289	87 47 14 3273	89 11 57 3257	90 25 17 3245				
	Fomalhaut W.	51 57 43 3174	53 24 23 3143	54 51 41 3111	55 44 29 3086				
	$\alpha$ Pegasi W.	39 15 26 3711	40 32 1 3637	41 49 3 3563	42 46 15 3505				
	Aldebaran E.	44 46 42 2755	43 11 15 2741	41 35 1 2720	40 24 13 2698				
	SUN E.	104 35 29 3092	103 7 10 3077	101 38 1 3061	100 19 33 3051				
31	$\alpha$ Aquilæ W.	97 45 43 3185	99 12 10 3173	100 38 0 3161	101 50 17 3151				
	Fomalhaut W.	63 47 17 2956	65 18 25 2933	66 50 1 2919	67 41 13 2907				
	$\alpha$ Pegasi W.	50 0 57 3248	51 26 10 3204	52 42 1 3151	53 33 13 3098				
	Aldebaran E.	31 54 17 2638	30 16 14 2624	28 58 1 2610	27 49 13 2598				
	SUN E.	92 40 10 2966	91 9 15 2950	89 48 1 2934	88 37 13 2919				



## CONFIGURATIONS OF THE SATELLITES OF JUPITER,

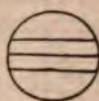
At 8<sup>h</sup> 30<sup>m</sup>, MEAN TIME.

Day of the Month.	West.	East.
1	•4                      2•      •3 ○ 1•	
2	•4                      •2      ○                      •3	● •1
3	•4 1•      ○                      •2      3•	
4	2• ○    ○                      •1 <sup>4</sup> 3•	
5	•2      •13•      ○                      •4	
6	•2 ●                      3•                      ○      1•                      •4	
7	•3                      •1      ○                      2•                      •4	
8	2• •3      ○      1•                      4•	
9	•2      •1 ○                      •3                      4•	
10	1• ○    ○                      •2      3• 4•	
11	○                      2• <sup>1</sup> 4• 3•	
12	•2      1•      3• <sup>4</sup> ○	
13	3• 4•                      ○      1•	● •2
14	4•      •3                      •1      ○                      2•	
15	4•    •32•      ○      1•	
16	•4    •2      •1 ○                      •3	
17	•4    ○                      •2                      •3	○ 1•
18	•4    ○                      2•                      3•	● •1
19	•4 2•      1•      ○	○ 3•
20	3•                      •1 <sup>4</sup> 2 ○                      •1	
21	•3                      •1      ○                      •42•	
22	•3                      2•      ○      1•                      •4	
23	•2      •1      ○                      •3                      •4	
24	○      1•      •2                      •3                      •4	
25	•1 ●    ○                      2•                      3•                      4•	
26	2•                      1•      ○      3•                      4•	
27	3•                      •2      ○                      •1                      4•	
28	•3                      1•                      ○                      4•      2•	
29	•3                      4•                      ○      1•	○ 2•
30	4•      •2      •1                      ○	● •3
31	4•    ○                      1• <sup>2</sup> •3	

This Table represents, at 8<sup>h</sup> 30<sup>m</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the page; the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of the Satellites' motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite placed by the side of it is on the disc of Jupiter, and a black circle (●) that it is either *behind* the disc, or in the shadow, of Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

SATELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.	2†	h m s 10 18 49·8	h m s 17 1 11·7	Em.
	4	4 47 28·7	11 36 49·4	Em.
	5	23 16 12·9	6 12 32·2	Em.
	7	17 44 52·2	0 48 10·2	Em.
	9	12 13 34·2	19 23 50·9	Em.
	11	6 42 12·8	13 59 28·2	Em.
	13	1 10 56·7	8 35 10·8	Em.
	14	19 39 35·8	3 10 48·6	Em.
	16	14 8 17·8	21 46 29·2	Em.
	18†	8 36 55·9	16 22 6·0	Em.
	20	3 5 39·8	10 57 48·6	Em.
	21	21 34 18·5	5 33 26·0	Em.
	23	16 3 0·0	0 9 6·2	Em.
	25	10 31 37·7	18 44 42·6	Em.
	27	5 0 21·2	13 20 24·7	Em.
	28	23 28 59·5	7 56 1·7	Em.
	30	17 57 40·8	2 31 41·7	Em.
II.	2	19 21 58·7	2 5 49·9	Em.
	6†	8 40 22·4	15 38 14·4	Em.
	9	21 58 9·0	5 10 1·7	Em.
	13	11 16 24·7	18 42 18·3	Em.
	17	0 34 7·9	8 14 2·1	Em.
	20	13 52 15·6	21 46 10·6	Em.
	24	3 9 54·4	11 17 50·1	Em.
	27	16 27 53·9	0 49 50·4	Em.
	31	5 45 28·4	14 21 25·5	Em.
III.	1	14 31 11·7	21 10 18·6	Im.
	1	17 33 6·9	0 12 43·6	Em.
	8	18 30 25·5	1 37 47·5	Im.
	8	21 31 33·2	4 39 25·0	Em.
	15	22 30 12·9	6 5 50·3	Im.
	16	1 30 31·7	9 6 38·6	Em.
	23	2 29 21·2	10 33 13·8	Im.
	23	5 28 51·3	13 33 13·3	Em.
	30	6 28 25·8	15 0 33·5	Im.
	30	9 27 6·9	17 59 43·9	Em.
IV.	4	4 29 29·7	11 18 47·4	Im.
	4	7 0 37·6	13 50 20·2	Em.
	20	22 33 22·8	6 28 43·4	Im.
	21	0 53 7·0	8 48 50·6	Em.



e \*



e \*



i \*

e \*





APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHADOWS.	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Egress.
	d h m	d h m	d h m	d h m	d h m	d h m
I.	2 13 36		1* 16 24	1 18 42	1† 17 35	1 19 52
	4 8 12		3 11 0	3 13 19	3 12 11	3 14 28
	5 2 49		4 5 37	5 7 55	4 6 46	5 9 3
	7 21 25		6 0 13	6 2 32	6 1 22	6 3 39
	9† 16 2		8 18 50	8 21 8	8 19 58	8 22 15
	11 10 39	In	10 13 26	10† 15 45	10 14 33	10* 16 50
	12 5 15		12 8 3	12 10 22	12 9 9	12 11 26
	14 23 52		13 2 40	13 4 58	13 3 45	13 6 2
	16 18 29		15 21 17	15 23 35	15 22 21	15 0 37
	18 13 5	the	17† 15 54	17 18 12	17† 16 56	17 19 13
	19 7 42		19 10 30	19 12 48	19 11 32	19 13 49
	21 2 19		20 5 7	20 7 25	20 6 7	21 8 25
	23 20 56		22 23 44	22 2 2	22 0 43	22 3 0
	25 15 33	Shadow.	24 18 21	24 20 39	24 19 19	24 21 36
	27 10 10		26 12 58	26 15 16	26 13 55	26† 16 11
	28 4 47		27 7 35	28 9 53	28 8 30	28 10 47
	30 23 24		29 2 12	29 4 30	29 3 6	29 5 23
			31 20 48	31 23 7	31 21 41	31 23 58
II.	2 20 57		4† 15 15	4 18 6	0 4 5	1 6 52
	6 10 33		7 4 51	8 7 41	4† 17 37	4 20 24
	9 0 9	In	11 18 26	11 21 17	8 7 8	8 9 56
	13 13 45		15 8 3	15 10 53	11 20 40	11 23 28
	16 3 22	the	18 21 39	18 0 30	15 10 12	15 13 0
	20† 16 59		22 11 16	22 14 7	18 23 44	18 2 32
	23 6 35	Shadow.	25 0 53	25 3 44	22 13 16	22 16 3
	27 20 12		29 14 30	29† 17 21	25 2 48	25 5 35
	31 9 50				29† 16 20	29 19 7
III.	1* 16 13	1 19 40	4 6 30	5 9 57	5 11 15	5 14 29
	8 20 54	8 0 20	12 11 12	12 14 38	12† 15 42	12 18 55
	15 1 38	15 5 4	19† 15 57	19 19 22	19 20 10	19 23 22
	22 6 24	23 9 49	26 20 44	26 0 9	26 0 37	26 3 48
	30 11 12	30 14 37				
IV.	3 23 43	3 3 37	12 8 15	12 12 6	12 18 58	12 21 44
	20 20 19	20 0 7	28 5 7	29 8 50	29 14 8	29† 16 44

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>h</sup> .629573. Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	+0.4988	-1.3038	+9.4229	+0.8594	17 20 25.34	100	181	.496
2	0.5391	1.3025	9.4283	0.8587	17 16 29.43	101	182	.498
3	0.5759	1.3011	9.4335	0.8579	17 12 33.52	102	183	.501
4	+0.6097	-1.2996	+9.4387	+0.8571	17 8 37.60	103	184	.504
5	0.6410	1.2979	9.4439	0.8562	17 4 41.69	104	185	.507
6	0.6700	1.2961	9.4489	0.8553	17 0 45.78	105	186	.509
7	+0.6971	-1.2942	+9.4538	+0.8544	16 56 49.87	106	187	.512
8	0.7225	1.2921	9.4587	0.8535	16 52 53.96	107	188	.515
9	0.7464	1.2899	9.4635	0.8525	16 48 58.05	108	189	.517
10	+0.7689	-1.2876	+9.4683	+0.8515	16 45 2.14	109	190	.520
11	0.7902	1.2852	9.4729	0.8504	16 41 6.23	110	191	.523
12	0.8104	1.2826	9.4775	0.8493	16 37 10.32	111	192	.526
13	+0.8296	-1.2798	+9.4820	+0.8482	16 33 14.41	112	193	.528
14	0.8479	1.2770	9.4864	0.8471	16 29 18.50	113	194	.531
15	0.8653	1.2740	9.4908	0.8459	16 25 22.58	114	195	.534
16	+0.8819	-1.2708	+9.4951	+0.8447	16 21 26.67	115	196	.537
17	0.8978	1.2675	9.4993	0.8435	16 17 30.76	116	197	.539
18	0.9130	1.2641	9.5035	0.8422	16 13 34.85	117	198	.542
19	+0.9276	-1.2605	+9.5075	+0.8409	16 9 38.94	118	199	.545
20	0.9416	1.2568	9.5116	0.8396	16 5 43.03	119	200	.548
21	0.9550	1.2529	9.5155	0.8383	16 1 47.12	120	201	.550
22	+0.9680	-1.2488	+9.5194	+0.8369	15 57 51.21	121	202	.553
23	0.9804	1.2446	9.5233	0.8355	15 53 55.30	122		.556
24	0.9924	1.2402	9.5270	0.8341	15 49 59.39			9
25	+1.0039	-1.2357	+9.5307	+0.8327	15 46 3.			
26	1.0150	1.2310	9.5343	0.8312	15 42 "			
27	1.0258	1.2261	9.5379	0.8297	15 38			
28	+1.0361	-1.2210	+9.5414	+0.8282	15 34			
29	1.0461	1.2157	9.5448	0.8267	15 30			
30	1.0558	1.2103	9.5482	0.8252				
31	1.0651	1.2047	9.5516	0.8236				
32	+1.0741	-1.1988	+9.5549	+0.8221				



## AT APPARENT NOON.

Day of the Week. Day of the Month.		THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be added to subt. from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Thur.	1	h m s 8 44 58.59	s 9.704	° ' " N. 18 4 10.7	" 38.05	m s 1 6.59	m s 6 0.61	s 0.11
Frid.	2	8 48 51.49	9.680	17 48 57.5	38.78	1 6.50	5 56.97	0.11
Sat.	3	8 52 43.81	9.655	17 33 26.8	39.50	1 6.41	5 52.74	0.20
Sun.	4	8 56 35.54	9.631	17 17 38.9	40.20	1 6.32	5 47.92	0.22
Mon.	5	9 0 26.69	9.607	17 1 34.1	40.89	1 6.24	5 42.53	0.24
Tues.	6	9 4 17.25	9.582	16 45 12.7	41.57	1 6.15	5 36.56	0.27
Wed.	7	9 8 7.22	9.558	16 28 35.1	42.23	1 6.07	5 29.99	0.29
Thur.	8	9 11 56.60	9.533	16 11 41.5	42.89	1 5.98	5 22.83	0.31
Frid.	9	9 15 45.39	9.509	15 54 32.2	43.53	1 5.90	5 15.10	0.34
Sat.	10	9 19 33.60	9.484	15 37 7.5	44.15	1 5.82	5 6.78	0.37
Sun.	11	9 23 21.22	9.460	15 19 27.9	44.76	1 5.74	4 57.87	0.39
Mon.	12	9 27 8.27	9.436	15 1 33.6	45.36	1 5.66	4 48.39	0.44
Tues.	13	9 30 54.74	9.413	14 43 24.9	45.95	1 5.58	4 38.33	0.44
Wed.	14	9 34 40.64	9.389	14 25 2.1	46.52	1 5.50	4 27.71	0.44
Thur.	15	9 38 25.98	9.366	14 6 25.6	47.08	1 5.42	4 16.52	0.44
Frid.	16	9 42 10.77	9.344	13 47 35.6	47.63	1 5.34	4 4.79	0.5
Sat.	17	9 45 55.02	9.322	13 28 32.6	48.16	1 5.27	3 52.52	0.5
Sun.	18	9 49 38.74	9.300	13 9 16.8	48.68	1 5.19	3 39.72	0.5
Mon.	19	9 53 21.95	9.279	12 49 48.5	49.18	1 5.12	3 26.41	0.5
Tues.	20	9 57 4.65	9.259	12 30 8.1	49.68	1 5.05	3 12.60	0.5
Wed.	21	10 0 46.87	9.240	12 10 15.8	50.16	1 4.98	2 58.30	0.6
Thur.	22	10 4 28.62	9.221	11 50 11.9	50.63	1 4.91	2 43.54	0.6
Frid.	23	10 8 9.92	9.203	11 29 56.8	51.08	1 4.85	2 28.33	0.6
Sat.	24	10 11 50.78	9.185	11 9 30.8	51.53	1 4.79	2 12.68	0.6
Sun.	25	10 15 31.23	9.169	10 48 54.1	51.96	1 4.73	1 56.62	0.6
Mon.	26	10 19 11.28	9.153	10 28 7.1	52.37	1 4.67	1 40.16	0.7
Tues.	27	10 22 50.95	9.138	10 7 10.1	52.78	1 4.61	1 23.32	0.7
Wed.	28	10 26 30.25	9.123	9 46 3.3	53.17	1 4.55	1 6.12	0.7
Thur.	29	10 30 9.21	9.110	9 24 47.1	53.55	1 4.50	0 48.57	0.7
Frid.	30	10 33 47.84	9.096	9 3 21.8	53.92	1 4.45	0 30.70	0.7
Sat.	31	10 37 26.15	9.084	8 41 47.8	54.27	1 4.40	0 12.51	0.7
Sun.	32	10 41 4.17		N. 8 20 5.3		1 4.35	0 5.97	

\* Mean Time of the Semidiameter passing may be found by subtracting 0.18 from the Sidereal Time.

## AT MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S			Equation of Time, to be subt. from added to Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<i>h m s</i>	<i>° ′ ″</i>	<i>′ ″</i>	<i>m s</i>	<i>h m s</i>
Thur.	1	8 44 57.62	N. 18 4 14.5	15 47.0	6 0.62	8 38 56.99
Frid.	2	8 48 50.54	17 49 1.3	15 47.2	5 56.99	8 42 53.55
Sat.	3	8 52 42.87	17 33 30.7	15 47.3	5 52.76	8 46 50.10
Sun.	4	8 56 34.61	17 17 42.8	15 47.4	5 47.95	8 50 46.66
Mon.	5	9 0 25.77	17 1 38.0	15 47.6	5 42.56	8 54 43.21
Tues.	6	9 4 16.35	16 45 16.6	15 47.7	5 36.58	8 58 39.77
Wed.	7	9 8 6.34	16 28 39.0	15 47.8	5 30.01	9 2 36.32
Thur.	8	9 11 55.74	16 11 45.3	15 48.0	5 22.86	9 6 32.88
Frid.	9	9 15 44.56	15 54 36.0	15 48.2	5 15.13	9 10 29.43
Sat.	10	9 19 32.79	15 37 11.3	15 48.3	5 6.81	9 14 25.99
Sun.	11	9 23 20.44	15 19 31.6	15 48.5	4 57.90	9 18 22.54
Mon.	12	9 27 7.52	15 1 37.2	15 48.7	4 48.42	9 22 19.10
Tues.	13	9 30 54.02	14 43 28.4	15 48.9	4 38.36	9 26 15.65
Wed.	14	9 34 39.94	14 25 5.5	15 49.0	4 27.74	9 30 12.20
Thur.	15	9 38 25.31	14 6 28.9	15 49.2	4 16.56	9 34 8.76
Frid.	16	9 42 10.14	13 47 38.9	15 49.4	4 4.83	9 38 5.31
Sat.	17	9 45 54.42	13 28 35.7	15 49.6	3 52.56	9 42 1.87
Sun.	18	9 49 38.17	13 9 19.8	15 49.8	3 39.75	9 45 58.42
Mon.	19	9 53 21.42	12 49 51.4	15 50.0	3 26.44	9 49 54.97
Tues.	20	9 57 4.16	12 30 10.8	15 50.2	3 12.63	9 53 51.53
Wed.	21	10 0 46.41	12 10 18.3	15 50.4	2 58.33	9 57 48.08
Thur.	22	10 4 28.20	11 50 14.2	15 50.6	2 43.57	10 1 44.63
Frid.	23	10 8 9.54	11 29 58.9	15 50.8	2 28.36	10 5 41.19
Sat.	24	10 11 50.45	11 9 32.7	15 51.0	2 12.71	10 9 37.74
Sun.	25	10 15 30.94	10 48 55.8	15 51.2	1 56.64	10 13 34.29
Mon.	26	10 19 11.03	10 28 8.6	15 51.4		10 17 30.85
Tues.	27	10 22 50.74	10 7 11.3	15 51		10 21 27.40
Wed.	28	10 26 30.09	9 46 4.3	15		10 25 19.95
Thur.	29	10 30 9.09	9 24 47.8			10 29 11.51
Frid.	30	10 33 47.76	9 3 22.2			10 33 3.6
Sat.	31	10 37 26.12	8 41 47.9			
Sun.	32	10 41 4.19	N. 8 20 5.2	15 52		

\* The Semidiameter for *Apparent* Noon may be ascertained



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax.	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Midnight.
1	128 48 25.3	S. 0° 56'	0.0063170	15 37.0	15 44.2	57 18.7	57 44.8
2	129 45 52.3	0° 54'	0.0062599	15 51.5	15 58.9	58 11.7	58 38.8
3	130 43 20.4	0° 49'	0.0062006	16 6.2	16 13.3	59 5.7	59 31.9
4	131 40 49.8	0° 41'	0.0061392	16 20.1	16 26.3	59 56.7	60 19.4
5	132 38 20.5	0° 30'	0.0060757	16 31.7	16 36.1	60 39.2	60 55.3
6	133 35 52.4	0° 18'	0.0060099	16 39.5	16 41.6	61 7.8	61 15.5
7	134 33 25.4	S. 0° 05'	0.0059418	16 42.4	16 41.9	61 18.5	61 16.6
8	135 30 59.6	N. 0° 08'	0.0058714	16 40.0	16 36.9	61 9.8	60 58.3
9	136 28 34.9	0° 21'	0.0057987	16 32.6	16 27.2	60 42.4	60 22.7
10	137 26 11.3	0° 33'	0.0057237	16 20.9	16 14.0	59 59.8	59 34.4
11	138 23 48.6	0° 43'	0.0056465	16 6.6	15 58.9	59 7.1	58 38.8
12	139 21 27.1	0° 51'	0.0055672	15 51.0	15 43.2	58 10.0	57 41.3
13	140 19 6.5	0° 56'	0.0054860	15 35.6	15 28.3	57 13.3	56 46.5
14	141 16 46.9	0° 58'	0.0054030	15 21.4	15 15.0	56 21.3	55 57.9
15	142 14 28.3	0° 58'	0.0053183	15 9.2	15 3.9	55 36.4	55 17.1
16	143 12 10.8	0° 55'	0.0052320	14 59.2	14 55.2	54 59.9	54 45.0
17	144 9 54.3	0° 48'	0.0051442	14 51.7	14 48.8	54 32.3	54 21.7
18	145 7 38.8	0° 39'	0.0050552	14 46.5	14 41.7	54 13.1	54 6.6
19	146 5 24.6	0° 28'	0.0049651	14 43.4	14 42.6	54 1.9	53 59.1
20	147 3 11.6	0° 15'	0.0048739	14 42.3	14 42.4	53 57.9	53 58.3
21	148 0 59.9	N. 0° 02'	0.0047818	14 43.0	14 43.9	54 0.3	54 3.7
22	148 58 49.6	S. 0° 12'	0.0046890	14 45.2	14 46.9	54 8.6	54 14.6
23	149 56 40.8	0° 25'	0.0045954	14 48.9	14 51.2	54 22.0	54 30.4
24	150 54 33.5	0° 36'	0.0045011	14 53.8	14 56.8	54 40.1	54 50.9
25	151 52 27.8	0° 45'	0.0044060	15 0.0	15 3.6	55 2.8	55 15.9
26	152 50 23.8	0° 52'	0.0043100	15 7.4	15 11.6	55 30.0	55 45.2
27	153 48 21.7	0° 56'	0.0042132	15 16.0	15 20.7	56 1.4	56 18.7
28	154 46 21.3	0° 58'	0.0041154	15 25.7	15 31.0	56 37.1	56 56.6
29	155 44 22.9	0° 56'	0.0040165	15 36.5	15 42.3	57 16.9	57 37.9
30	156 42 26.4	0° 51'	0.0039165	15 48.2	15 54.2	57 59.5	58 21.8
31	157 40 31.8	0° 44'	0.0038153	16 0.3	16 6.3	58 44.2	59 6.1
32	158 38 39.2	S. 0° 34'	0.0037129	16 12.1	16 17.5	59 27.2	59 47.0

## MEAN TIME.

Day of the Week.	Day of the Month.	THE MOON'S							
		Longitude.		Latitude.		Age.		Meridian	
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.	d	h m
Thur.	1	42 14 54.1	48 56 56.7	S. 5 17 32.3	S. 5 16 58.1	22.9	18 44.9		
Frid.	2	55 45 13.9	62 39 54.2	5 11 59.0	5 2 26.5	23.9	19 38.5		
Sat.	3	69 40 58.9	76 48 21.5	4 48 16.1	4 29 28.1	24.9	20 35.9		
Sun.	4	84 1 46.0	91 20 46.9	4 6 9.0	3 38 32.1	25.9	21 36.6		
Mon.	5	98 44 48.6	106 13 5.5	3 6 57.4	2 31 53.1	26.9	22 39.1		
Tues.	6	113 44 43.2	121 18 39.9	1 53 54.9	S. 1 13 44.4	27.9	23 41.4		
Wed.	7	128 53 47.4	136 28 55.2	S. 0 32 9.1	N. 0 10 0.5	28.9	0		
Thur.	8	144 2 52.1	151 34 29.1	N. 0 51 53.0	1 32 37.8	0.6	0 41.7		
Frid.	9	159 2 42.0	166 26 33.5	2 11 28.0	2 47 41.9	1.6	1 39.1		
Sat.	10	173 45 15.2	180 58 8.2	3 20 44.1	3 50 6.5	2.6	2 33.4		
Sun.	11	188 4 44.4	195 4 45.7	4 15 28.3	4 36 35.5	3.6	3 25.0		
Mon.	12	201 58 3.8	208 44 39.1	4 53 20.9	5 5 42.5	4.6	4 14.6		
Tues.	13	215 24 40.6	221 58 22.9	5 13 43.0	5 17 28.3	5.6	5 3.0		
Wed.	14	228 26 6.9	234 48 17.2	5 17 7.5	5 12 52.1	6.6	5 50.9		
Thur.	15	241 5 21.3	247 17 49.5	5 4 53.7	4 53 26.2	7.6	6 38.8		
Frid.	16	253 26 12.7	259 31 2.6	4 38 43.9	4 21 1.4	8.6	7 26.9		
Sat.	17	265 32 50.7	271 32 8.0	4 0 33.5	3 37 35.7	9.6	8 15.2		
Sun.	18	277 29 24.6	283 25 9.1	3 12 24.1	2 45 14.7	10.6	9 3.5		
Mon.	19	289 19 49.2	295 13 50.2	2 16 23.9	1 46 9.4	11.6	9 51.4		
Tues.	20	301 7 36.0	307 1 29.0	1 14 48.3	N. 0 42 39.3	12.6	10 38.6		
Wed.	21	312 55 49.9	318 50 57.8	N. 0 10 1.0	S. 0 22 47.2	13.6	11 24.8		
Thur.	22	324 47 10.1	330 44 43.4	S. 0 55 25.6	1 27 33.6	14.6	12 9.9		
Frid.	23	336 43 52.9	342 44 53.0	1 58 51.3	2 28 58.1	15.6	12 54.2		
Sat.	24	348 47 57.5	354 53 19.8	2 57 33.8	3 24 18.2	16.6	13 37.9		
Sun.	25	1 1 13.4	7 11 51.8	3 48 51.6	4 10 55.7	17.6	14 21.7		
Mon.	26	13 25 28.6	19 42 17.4	4 30 12.0	4 46 23.2	18.6	15 6.1		
Tues.	27	26 2 32.9	32 26 29.6	4 59 13.8	5 8 29.2	19.6	15 52.0		
Wed.	28	38 54 22.3	45 26 25.6	5 13 56.6	5 15 24.6	20.6	16 40.0		
Thur.	29	52 2 53.2	58 43 58.1	5 12 44.6	5 5 49.8	21.6	17 30.9		
Frid.	30	65 29 51.2	72 20 40.8	4 54 36.9	4 39 6.0	22.6	18 25.0		
Sat.	31	79 16 32.1	86 17 25.6	4 19 20.3	3 55 28.9	23.6	19 22.3		
Sun.	32	93 23 17.8	100 33 57.6	S. 3 27 44.6	S. 2 56 26.7	24.6	20 22.0		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 1.				SATURDAY 3.			
0	2 45 46.95	N.10 28 45.1	97.75	0	4 35 4.61	N.17 9 59.3	
1	2 47 55.75	10 38 31.6	97.32	1	4 37 29.90	17 16 23.9	
2	2 50 4.84	10 48 15.5	96.88	2	4 39 55.54	17 22 42.2	
3	2 52 14.24	10 57 56.8	96.43	3	4 42 21.55	17 28 54.5	
4	2 54 23.95	11 7 35.4	95.97	4	4 44 47.90	17 35 0.5	
5	2 56 33.96	11 17 11.2	95.50	5	4 47 14.61	17 41 0.2	
6	2 58 44.28	11 26 44.2	95.03	6	4 49 41.67	17 46 53.6	
7	3 0 54.91	11 36 14.4	94.53	7	4 52 9.07	17 52 40.6	
8	3 3 5.86	11 45 41.6	94.03	8	4 54 36.83	17 58 21.1	
9	3 5 17.13	11 55 5.8	93.52	9	4 57 4.93	18 3 55.0	
10	3 7 28.71	12 4 26.9	93.00	10	4 59 33.37	18 9 22.2	
11	3 9 40.63	12 13 44.9	92.45	11	5 2 2.15	18 14 42.8	
12	3 11 52.86	12 22 59.6	91.92	12	5 4 31.27	18 19 56.5	
13	3 14 5.43	12 32 11.1	91.35	13	5 7 0.73	18 25 3.4	
14	3 16 18.32	12 41 19.2	90.77	14	5 9 30.52	18 30 3.3	
15	3 18 31.54	12 50 23.8	90.20	15	5 12 0.64	18 34 56.2	
16	3 20 45.11	12 59 25.0	89.60	16	5 14 31.09	18 39 42.1	
17	3 22 59.01	13 8 22.6	89.00	17	5 17 1.86	18 44 20.7	
18	3 25 13.24	13 17 16.6	88.37	18	5 19 32.95	18 48 52.2	
19	3 27 27.82	13 26 6.8	87.75	19	5 22 4.36	18 53 16.3	
20	3 29 42.74	13 34 53.3	87.10	20	5 24 36.08	18 57 33.1	
21	3 31 58.00	13 43 35.9	86.47	21	5 27 8.11	19 1 42.5	
22	3 34 13.61	13 52 14.7	85.78	22	5 29 40.45	19 5 44.4	
23	3 36 29.57	N.14 0 49.4	85.10	23	5 32 13.09	N.19 9 38.7	
FRIDAY 2.				SUNDAY 4.			
0	3 38 45.88	N.14 9 20.0	84.42	0	5 34 46.02	N.19 13 25.4	
1	3 41 2.54	14 17 46.5	83.72	1	5 37 19.25	19 17 4.4	
2	3 43 19.55	14 26 8.8	83.00	2	5 39 52.77	19 20 35.7	
3	3 45 36.91	14 34 26.8	82.27	3	5 42 26.57	19 23 59.1	
4	3 47 54.63	14 42 40.4	81.53	4	5 45 0.66	19 27 14.7	
5	3 50 12.70	14 50 49.6	80.77	5	5 47 35.01	19 30 22.3	
6	3 52 31.14	14 58 54.2	80.02	6	5 50 9.64	19 33 21.9	
7	3 54 49.92	15 6 54.3	79.23	7	5 52 44.53	19 36 13.5	
8	3 57 9.07	15 14 49.7	78.45	8	5 55 19.68	19 38 57.0	
9	3 59 28.58	15 22 40.4	77.65	9	5 57 55.08	19 41 32.4	
10	4 1 48.45	15 30 26.3	76.82	10	6 0 30.74	19 43 59.5	
11	4 4 8.68	15 38 7.2	76.00	11	6 3 6.63	19 46 18.4	
12	4 6 29.27	15 45 43.2	75.17	12	6 5 42.76	19 48 29.0	
13	4 8 50.22	15 53 14.2	74.30	13	6 8 19.13	19 50 31.2	
14	4 11 11.54	16 0 40.0	73.43	14	6 10 55.72	19 52 25.0	
15	4 13 33.22	16 8 0.6	72.55	15	6 13 32.52	19 54 10.4	
16	4 15 55.26	16 15 15.9	71.67	16	6 16 9.55	19 55 47.3	
17	4 18 17.66	16 22 25.9	70.77	17	6 18 46.78	19 57 15.6	
18	4 20 40.43	16 29 30.5	69.83	18	6 21 24.20	19 58 35.4	
19	4 23 3.56	16 36 29.5	68.92	19	6 24 1.83	19 59 46.5	
20	4 25 27.05	16 43 23.0	67.97	20	6 26 39.64	20 0 49.0	
21	4 27 50.90	16 50 10.8	67.02	21	6 29 17.63	20 1 42.8	
22	4 30 15.11	16 56 52.9	66.03	22	6 31 55.80	20 2 27.9	
23	4 32 39.69	17 3 29.1	65.07	23	6 34 34.13	20 3 4.2	
24	4 35 4.61	N.17 9 59.5		24	6 37 12.63	N.20 3 31.8	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

hr.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 5.				WEDNESDAY 7.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	6 37 12.63	N. 20 3 31.8	3.12	0	8 44 43.97	N. 17 31 49.1	66.32
1	6 39 51.28	20 3 50.5	1.65	1	8 47 21.32	17 25 11.2	67.58
2	6 42 30.07	20 4 0.4	0.17	2	8 49 58.48	17 18 25.7	68.88
3	6 45 9.01	20 4 1.4	1.32	3	8 52 35.44	17 11 32.4	70.12
4	6 47 48.07	20 3 53.5	2.80	4	8 55 12.19	17 4 31.7	71.38
5	6 50 27.26	20 3 36.7	4.28	5	8 57 48.74	16 57 23.4	72.60
6	6 53 6.57	20 3 11.0	5.78	6	9 0 25.08	16 50 7.8	73.83
7	6 55 45.99	20 2 36.3	7.27	7	9 3 1.20	16 42 44.8	75.05
8	6 58 25.50	20 1 52.7	8.77	8	9 5 37.10	16 35 14.5	76.23
9	7 1 5.12	20 1 0.1	10.27	9	9 8 12.78	16 27 37.1	77.43
10	7 3 44.82	19 59 58.5	11.75	10	9 10 48.22	16 19 52.5	78.58
11	7 6 24.60	19 58 48.0	13.27	11	9 13 23.43	16 12 1.0	79.75
12	7 9 4.46	19 57 28.4	14.77	12	9 15 58.40	16 4 2.5	80.88
13	7 11 44.38	19 55 59.8	16.27	13	9 18 33.13	15 55 57.2	82.02
14	7 14 24.35	19 54 22.2	17.77	14	9 21 7.61	15 47 45.1	83.13
15	7 17 4.38	19 52 35.6	19.27	15	9 23 41.84	15 39 26.3	84.23
16	7 19 44.44	19 50 40.0	20.77	16	9 26 15.81	15 31 0.9	85.30
17	7 22 24.54	19 48 35.4	22.27	17	9 28 49.53	15 22 29.1	86.38
18	7 25 4.67	19 46 21.8	23.77	18	9 31 22.99	15 13 50.8	87.43
19	7 27 44.81	19 43 59.2	25.27	19	9 33 56.18	15 5 6.2	88.47
20	7 30 24.97	19 41 27.6	26.75	20	9 36 29.11	14 56 15.4	89.50
21	7 33 5.13	19 38 47.1	28.25	21	9 39 1.77	14 47 18.4	90.50
22	7 35 45.28	19 35 57.6	29.73	22	9 41 34.15	14 38 15.4	91.48
23	7 38 25.42	N. 19 32 59.2	31.22	23	9 44 6.27	N. 14 29 6.5	92.48
TUESDAY 6.				THURSDAY 8.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	7 41 5.55	N. 19 29 51.9	32.70	0	9 46 38.09	N. 14 19 51.6	93.43
1	7 43 45.65	19 26 35.7	34.18	1	9 49 9.64	14 10 31.0	94.37
2	7 46 25.72	19 23 10.6	35.65	2	9 51 40.92	14 1 4.8	95.32
3	7 49 5.74	19 19 36.7	37.12	3	9 54 11.90	13 51 32.9	96.22
4	7 51 45.71	19 15 54.0	38.58	4	9 56 42.61	13 41 55.6	97.10
5	7 54 25.63	19 12 2.5	40.05	5	9 59 13.02	13 32 13.0	98.00
6	7 57 5.48	19 8 2.2	41.50	6	10 1 43.15	13 22 25.0	98.85
7	7 59 45.26	19 3 53.2	42.93	7	10 4 12.98	13 12 31.9	99.72
8	8 2 24.96	18 59 35.6	44.38	8	10 6 42.53	13 2 33.6	100.53
9	8 5 4.58	18 55 9.3	45.82	9	10 9 11.78	12 52 30.4	101.35
10	8 7 44.10	18 50 34.4	47.25	10	10 11 40.74	12 42 22.3	102.15
11	8 10 23.52	18 45 50.9	48.67	11	10 14 9.40	12 32 9.4	102.93
12	8 13 2.84	18 40 58.9	50.08	12	10 16 37.76	12 21 51.8	103.70
13	8 15 42.04	18 35 58.4	51.48	13	10 19 5.83	12 11 29.6	104.45
14	8 18 21.13	18 30 49.5	52.88	14	10 21 33.60	12 1 2.9	105.17
15	8 21 0.08	18 25 32.2	54.27	15	10 24 1.08	11 50 31.9	105.90
16	8 23 38.91	18 20 6.6	55.63	16	10 26 28.25	11 39 56.5	106.58
17	8 26 17.59	18 14 32.8	57.02	17	10 28 55.13	11 29 17.0	107.27
18	8 28 56.13	18 8 50.7	58.37	18	10 31 21.71	11 18 33.4	107.93
19	8 31 34.52	18 3 0.5	59.73	19	10 33 47.99	11 7 45.8	108.60
20	8 34 12.75	17 57 2.1	61.05	20	10 36 13.98	10 56 54.2	109.22
21	8 36 50.81	17 50 55.8	62.40	21	10 38 39.66	10 45 58.9	109.82
22	8 39 28.71	17 44 41.4	63.70	22	10 41 5.05	10 35 0.0	110.43
23	8 42 6.43	17 38 19.2	65.02	23	10 43 30.13	10 23 57.4	111.02
24	8 44 43.97	N. 17 31 49.1		24	10 45 54.92	N. 10 12 51.3	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 9.				SUNDAY 11.			
0	h m s 10 45 54.92	N. 10 12 51.3	111.58	0	h m s 12 36 23.67	N. 0 42 21.5	12
1	10 48 19.41	10 1 41.8	112.12	1	12 38 35.97	0 30 16.8	12
2	10 50 43.61	9 50 29.1	112.67	2	12 40 48.09	0 18 13.0	12
3	10 53 7.51	9 39 13.1	113.17	3	12 43 0.02	N. 0 6 10.1	12
4	10 55 31.12	9 27 54.1	113.67	4	12 45 11.75	S. 0 5 51.9	12
5	10 57 54.43	9 16 32.1	114.17	5	12 47 23.31	0 17 52.8	11
6	11 0 17.45	9 5 7.1	114.62	6	12 49 34.69	0 29 52.6	11
7	11 2 40.18	8 53 39.4	115.08	7	12 51 45.89	0 41 51.2	11
8	11 5 2.62	8 42 8.9	115.50	8	12 53 56.92	0 53 48.6	11
9	11 7 24.77	8 30 35.9	115.93	9	12 56 7.77	1 5 44.7	11
10	11 9 46.63	8 19 0.3	116.33	10	12 58 18.46	1 17 39.5	11
11	11 12 8.20	8 7 22.3	116.72	11	13 0 28.99	1 29 32.8	11
12	11 14 29.49	7 55 42.0	117.08	12	13 2 39.35	1 41 24.6	11
13	11 16 50.50	7 43 59.5	117.45	13	13 4 49.56	1 53 14.9	11
14	11 19 11.22	7 32 14.8	117.78	14	13 6 59.61	2 5 3.5	11
15	11 21 31.67	7 20 28.1	118.12	15	13 9 9.50	2 16 50.5	11
16	11 23 51.84	7 8 39.4	118.42	16	13 11 19.25	2 28 35.7	11
17	11 26 11.73	6 56 48.9	118.70	17	13 13 28.85	2 40 19.1	11
18	11 28 31.34	6 44 56.7	119.00	18	13 15 38.31	2 52 0.7	11
19	11 30 50.69	6 33 2.7	119.25	19	13 17 47.62	3 3 40.3	11
20	11 33 9.76	6 21 7.2	119.50	20	13 19 56.80	3 15 18.0	11
21	11 35 28.57	6 9 10.2	119.73	21	13 22 5.84	3 26 53.7	11
22	11 37 47.11	5 57 11.8	119.95	22	13 24 14.76	3 38 27.3	11
23	11 40 5.38	N. 5 45 12.1	120.15	23	13 26 23.54	S. 3 49 58.8	11
SATURDAY 10.				MONDAY 12.			
0	11 42 23.39	N. 5 33 11.2	120.35	0	13 28 32.19	S. 4 1 28.0	11
1	11 44 41.14	5 21 9.1	120.52	1	13 30 40.72	4 12 55.0	11
2	11 46 58.64	5 9 6.0	120.67	2	13 32 49.13	4 24 19.7	11
3	11 49 15.88	4 57 2.0	120.83	3	13 34 57.43	4 35 42.1	11
4	11 51 32.87	4 44 57.0	120.95	4	13 37 5.61	4 47 2.1	11
5	11 53 49.61	4 32 51.3	121.07	5	13 39 13.67	4 58 19.6	11
6	11 56 6.10	4 20 44.9	121.17	6	13 41 21.63	5 9 34.6	11
7	11 58 22.34	4 8 37.9	121.27	7	13 43 29.49	5 20 47.0	11
8	12 0 38.35	3 56 30.3	121.33	8	13 45 37.24	5 31 56.9	11
9	12 2 54.11	3 44 22.3	121.40	9	13 47 44.88	5 43 4.1	11
10	12 5 9.64	3 32 13.9	121.45	10	13 49 52.44	5 54 8.6	11
11	12 7 24.93	3 20 5.2	121.48	11	13 51 59.89	6 5 10.3	11
12	12 9 39.99	3 7 56.3	121.50	12	13 54 7.26	6 16 9.3	11
13	12 11 54.82	2 55 47.3	121.52	13	13 56 14.54	6 27 5.4	11
14	12 14 9.43	2 43 38.2	121.50	14	13 58 21.73	6 37 58.6	11
15	12 16 23.81	2 31 29.2	121.50	15	14 0 28.83	6 48 48.9	11
16	12 18 37.98	2 19 20.2	121.45	16	14 2 35.86	6 59 36.3	11
17	12 20 51.92	2 7 11.5	121.42	17	14 4 42.80	7 10 20.5	11
18	12 23 5.65	1 55 3.0	121.37	18	14 6 49.67	7 21 1.8	11
19	12 25 19.16	1 42 54.8	121.28	19	14 8 56.47	7 31 39.9	11
20	12 27 32.47	1 30 47.1	121.22	20	14 11 3.19	7 42 14.9	11
21	12 29 45.57	1 18 39.8	121.13	21	14 13 9.85	7 52 46.6	11
22	12 31 58.47	1 6 33.0	121.02	22	14 15 16.44	8 3 15.2	11
23	12 34 11.17	0 54 26.9	120.90	23	14 17 22.97	8 13 40.4	11
24	12 36 23.67	N. 0 42 21.5		24	14 19 29.43	S. 8 24 2.4	11



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 13.				THURSDAY 15.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	14 19 29.43	S. 8 24 2.4	103.10	0	16 0 7.63	S. 15 24 58.3	69.65
1	14 21 35.84	8 34 21.0	102.53	1	16 2 13.42	15 31 56.2	68.83
2	14 23 42.18	8 44 36.2	101.95	2	16 4 19.22	15 38 49.2	68.03
3	14 25 48.48	8 54 47.9	101.38	3	16 6 25.04	15 45 37.4	67.20
4	14 27 54.72	9 4 56.2	100.80	4	16 8 30.89	15 52 20.6	66.38
5	14 30 0.91	9 15 1.0	100.20	5	16 10 36.75	15 58 58.9	65.57
6	14 32 7.05	9 25 2.2	99.60	6	16 12 42.64	16 5 32.3	64.73
7	14 34 13.15	9 34 59.8	99.00	7	16 14 48.55	16 12 0.7	63.90
8	14 36 19.21	9 44 53.8	98.40	8	16 16 54.48	16 18 24.1	63.07
9	14 38 25.23	9 54 44.2	97.77	9	16 19 0.43	16 24 42.5	62.23
10	14 40 31.21	10 4 30.8	97.15	10	16 21 6.40	16 30 55.9	61.38
11	14 42 37.15	10 14 13.7	96.52	11	16 23 12.40	16 37 4.2	60.55
12	14 44 43.05	10 23 52.8	95.88	12	16 25 18.41	16 43 7.5	59.70
13	14 46 48.92	10 33 28.1	95.25	13	16 27 24.45	16 49 5.7	58.83
14	14 48 54.77	10 42 59.6	94.60	14	16 29 30.52	16 54 58.7	58.00
15	14 51 0.59	10 52 27.2	93.93	15	16 31 36.61	17 0 46.7	57.13
16	14 53 6.38	11 1 50.8	93.30	16	16 33 42.72	17 6 29.5	56.27
17	14 55 12.14	11 11 10.6	92.62	17	16 35 48.86	17 12 7.1	55.40
18	14 57 17.89	11 20 26.3	91.97	18	16 37 55.02	17 17 39.5	54.55
19	14 59 23.61	11 29 38.1	91.27	19	16 40 1.21	17 23 6.8	53.67
20	15 1 29.32	11 38 45.7	90.62	20	16 42 7.42	17 28 28.8	52.80
21	15 3 35.00	11 47 49.4	89.92	21	16 44 13.65	17 33 45.6	51.93
22	15 5 40.68	11 56 48.9	89.22	22	16 46 19.91	17 38 57.2	51.05
23	15 7 46.34	S. 12 5 44.2	88.53	23	16 48 26.19	S. 17 44 3.5	50.17
WEDNESDAY 14.				FRIDAY 16.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	15 9 51.98	S. 12 14 35.4	87.83	0	16 50 32.50	S. 17 49 4.5	49.28
1	15 11 57.62	12 23 22.4	87.12	1	16 52 38.83	17 54 0.2	48.40
2	15 14 3.25	12 32 5.1	86.42	2	16 54 45.18	17 58 50.6	47.52
3	15 16 8.87	12 40 43.6	85.70	3	16 56 51.56	18 3 35.7	46.63
4	15 18 14.48	12 49 17.8	84.98	4	16 58 57.96	18 8 15.5	45.73
5	15 20 20.10	12 57 47.7	84.25	5	17 1 4.38	18 12 49.9	44.83
6	15 22 25.70	13 6 13.2	83.52	6	17 3 10.83	18 17 18.9	43.95
7	15 24 31.31	13 14 34.3	82.80	7	17 5 17.29	18 21 42.6	43.05
8	15 26 36.92	13 22 51.1	82.05	8	17 7 23.78	18 26 0.9	42.13
9	15 28 42.53	13 31 3.4	81.30	9	17 9 30.28	18 30	41.25
10	15 30 48.14	13 39 11.2	80.57	10	17 11 36.80	18 34	40.33
11	15 32 53.76	13 47 14.6	79.80	11	17 13 43.35	18 38	39.42
12	15 34 59.38	13 55 13.4	79.05	12	17 15 49.91	18	38.52
13	15 37 5.01	14 3 7.7	78.30	13	17 17 56.49	18	37.60
14	15 39 10.64	14 10 57.5	77.52	14	17 20 3.09		36.70
15	15 41 16.28	14 18 42.6	76.77	15	17 22 9.71		
16	15 43 21.94	14 26 23.2	75.98	16	17 24 16.34		
17	15 45 27.60	14 33 59.1	75.20	17	17 26 22.97		
18	15 47 33.28	14 41 30.3	74.42	18	17 28 29.60		
19	15 49 38.96	14 48 56.8	73.65	19	17 30 36.23		
20	15 51 44.67	14 56 18.7	72.83	20	17 32 42.86		
21	15 53 50.38	15 3 35.7	72.07	21	17 34 49.49		
22	15 55 56.12	15 10 48.1	71.25	22	17 36 56.12		
23	15 58 1.87	15 17 55.6	70.45	23	17 39 0.75		
24	16 0 7.63	S. 15 24 58.3		24	17 41 7.38		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 17.				MONDAY 19.			
0	17 41 9.87	S. 19 22 29.8	27.48	0	19 22 19.91	S. 19 48 43.8	17
1	17 43 16.61	19 25 14.7	26.53	1	19 24 25.54	19 46 39.7	18
2	17 45 23.36	19 27 53.9	25.62	2	19 26 31.10	19 45 10.1	19
3	17 47 30.11	19 30 27.6	24.70	3	19 28 36.61	19 43 15.0	20
4	17 49 36.86	19 32 55.8	23.75	4	19 30 42.06	19 41 14.4	20
5	17 51 43.62	19 35 18.3	22.82	5	19 32 47.45	19 39 8.5	21
6	17 53 50.39	19 37 35.2	21.88	6	19 34 52.77	19 36 57.1	22
7	17 55 57.15	19 39 46.5	20.95	7	19 36 58.03	19 34 40.3	23
8	17 58 3.92	19 41 52.2	20.00	8	19 39 3.22	19 32 18.0	24
9	18 0 10.69	19 43 52.2	19.07	9	19 41 8.34	19 29 50.5	25
10	18 2 17.45	19 45 46.6	18.15	10	19 43 13.39	19 27 17.5	26
11	18 4 24.21	19 47 35.5	17.18	11	19 45 18.38	19 24 39.2	27
12	18 6 30.97	19 49 18.6	16.25	12	19 47 23.29	19 21 55.5	28
13	18 8 37.72	19 50 56.1	15.32	13	19 49 28.13	19 19 6.5	29
14	18 10 44.46	19 52 28.0	14.37	14	19 51 32.90	19 16 12.2	29
15	18 12 51.20	19 53 54.2	13.43	15	19 53 37.59	19 13 12.7	30
16	18 14 57.93	19 55 14.8	12.48	16	19 55 42.21	19 10 7.8	31
17	18 17 4.64	19 56 29.7	11.55	17	19 57 46.75	19 6 57.7	32
18	18 19 11.35	19 57 39.0	10.62	18	19 59 51.21	19 3 42.4	33
19	18 21 18.04	19 58 42.7	9.67	19	20 1 55.59	19 0 21.8	34
20	18 23 24.71	19 59 40.7	8.72	20	20 3 59.89	18 56 56.1	35
21	18 25 31.37	20 0 33.0	7.78	21	20 6 4.11	18 53 25.1	36
22	18 27 38.02	20 1 19.7	6.85	22	20 8 8.25	18 49 49.0	36
23	18 29 44.64	S. 20 2 0.8	5.90	23	20 10 12.30	S. 18 46 7.7	37
SUNDAY 18.				TUESDAY 20.			
0	18 31 51.25	S. 20 2 36.2	4.97	0	20 12 16.27	S. 18 42 21.3	38
1	18 33 57.83	20 3 6.0	4.02	1	20 14 20.16	18 38 29.8	39
2	18 36 4.39	20 3 30.1	3.10	2	20 16 23.95	18 34 33.2	40
3	18 38 10.93	20 3 48.7	2.15	3	20 18 27.66	18 30 31.5	41
4	18 40 17.44	20 4 1.6	1.20	4	20 20 31.29	18 26 24.8	41
5	18 42 23.92	20 4 8.8	0.27	5	20 22 34.82	18 22 13.0	42
6	18 44 30.37	20 4 10.4	0.67	6	20 24 38.26	18 17 56.3	43
7	18 46 36.79	20 4 6.4	1.60	7	20 26 41.61	18 13 34.5	44
8	18 48 43.18	20 3 56.8	2.53	8	20 28 44.87	18 9 7.8	45
9	18 50 49.53	20 3 41.6	3.47	9	20 30 48.04	18 4 36.2	46
10	18 52 55.86	20 3 20.8	4.42	10	20 32 51.12	17 59 59.6	46
11	18 55 2.14	20 2 54.3	5.33	11	20 34 54.10	17 55 18.2	47
12	18 57 8.39	20 2 22.3	6.27	12	20 36 56.99	17 50 31.9	48
13	18 59 14.60	20 1 44.7	7.20	13	20 38 59.78	17 45 40.7	49
14	19 1 20.77	20 1 1.5	8.13	14	20 41 2.48	17 40 44.8	50
15	19 3 26.90	20 0 12.7	9.07	15	20 43 5.08	17 35 44.0	50
16	19 5 32.98	19 59 18.3	9.98	16	20 45 7.59	17 30 38.5	51
17	19 7 39.02	19 58 18.4	10.92	17	20 47 9.99	17 25 28.2	52
18	19 9 45.01	19 57 12.9	11.83	18	20 49 12.30	17 20 13.2	53
19	19 11 50.96	19 56 1.9	12.77	19	20 51 14.51	17 14 53.5	54
20	19 13 56.85	19 54 45.3	13.68	20	20 53 16.62	17 9 29.1	54
21	19 16 2.70	19 53 23.2	14.60	21	20 55 18.64	17 4 0.1	55
22	19 18 8.49	19 51 55.6	15.53	22	20 57 20.55	16 58 26.5	56
23	19 20 14.23	19 50 22.4	16.43	23	20 59 22.37	16 52 48.3	57
24	19 22 19.91	S. 19 48 43.8		24	21 1 24.09	S. 16 47 5.5	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
WEDNESDAY 21.				FRIDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	21 1 24.09	S. 16 47 5.5	57.88	0	22 36 52.44	S. 10 53 12.1	88.12
1	21 3 25.71	16 41 18.2	58.63	1	22 38 49.65	10 44 23.4	88.62
2	21 5 27.22	16 35 26.4	59.40	2	22 40 46.78	10 35 31.7	89.10
3	21 7 28.64	16 29 30.0	60.12	3	22 42 43.85	10 26 37.1	89.57
4	21 9 29.96	16 23 29.3	60.87	4	22 44 40.86	10 17 39.7	90.05
5	21 11 31.17	16 17 24.1	61.60	5	22 46 37.79	10 8 39.4	90.52
6	21 13 32.29	16 11 14.5	62.32	6	22 48 34.66	9 59 36.3	90.98
7	21 15 33.30	16 5 0.6	63.05	7	22 50 31.47	9 50 30.4	91.43
8	21 17 34.22	15 58 42.3	63.77	8	22 52 28.22	9 41 21.8	91.87
9	21 19 35.03	15 52 19.7	64.48	9	22 54 24.91	9 32 10.6	92.33
10	21 21 35.74	15 45 52.8	65.18	10	22 56 21.54	9 22 56.6	92.75
11	21 23 36.35	15 39 21.7	65.88	11	22 58 18.11	9 13 40.1	93.20
12	21 25 36.87	15 32 46.4	66.58	12	23 0 14.64	9 4 20.9	93.62
13	21 27 37.28	15 26 6.9	67.28	13	23 2 11.11	8 54 59.2	94.03
14	21 29 37.59	15 19 23.2	67.97	14	23 4 7.52	8 45 35.0	94.43
15	21 31 37.80	15 12 35.4	68.65	15	23 6 3.89	8 36 8.4	94.85
16	21 33 37.91	15 5 43.5	69.32	16	23 8 0.21	8 26 39.3	95.25
17	21 35 37.92	14 58 47.6	70.00	17	23 9 56.48	8 17 7.8	95.65
18	21 37 37.84	14 51 47.6	70.67	18	23 11 52.71	8 7 33.9	96.02
19	21 39 37.65	14 44 43.6	71.33	19	23 13 48.90	7 57 57.8	96.42
20	21 41 37.37	14 37 35.6	71.98	20	23 15 45.05	7 48 19.3	96.78
21	21 43 36.99	14 30 23.7	72.63	21	23 17 41.16	7 38 38.6	97.15
22	21 45 36.51	14 23 7.9	73.28	22	23 19 37.23	7 28 55.7	97.50
23	21 47 35.94	S. 14 15 48.2	73.93	23	23 21 33.27	S. 7 19 10.7	97.87
THURSDAY 22.				SATURDAY 24.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	21 49 35.27	S. 14 8 24.6	74.57	0	23 23 29.28	S. 7 9 23.5	98.22
1	21 51 34.51	14 0 57.2	75.20	1	23 25 25.26	6 59 34.2	98.55
2	21 53 33.65	13 53 26.0	75.82	2	23 27 21.20	6 49 42.9	98.88
3	21 55 32.69	13 45 51.1	76.43	3	23 29 17.12	6 39 49.6	99.22
4	21 57 31.65	13 38 12.5	77.07	4	23 31 13.02	6 29 54.3	99.55
5	21 59 30.51	13 30 30.1	77.65	5	23 33 8.89	6 19 57.0	99.85
6	22 1 29.28	13 22 44.2	78.27	6	23 35 4.75	6 9 57.9	100.17
7	22 3 27.95	13 14 54.6	78.87	7	23 37 0.59	5 59 56.9	100.47
8	22 5 26.54	13 7 1.4	79.45	8	23 38 56.41	5 49 54.1	100.77
9	22 7 25.04	12 59 4.7	80.03	9	23 40 52.22	5 39 49.5	101.07
10	22 9 23.45	12 51 4.5	80.62	10	23 42 48.02	5 29 43.1	101.33
11	22 11 21.77	12 43 0.8	81.20	11	23 44 43.81	5 19 35.1	101.62
12	22 13 20.00	12 34 53.6	81.75	12	23 46 39.59	5 9 25.4	
13	22 15 18.15	12 26 43.1	82.33	13	23 48 35.37	4 59 14.1	
14	22 17 16.21	12 18 29.1	82.87	14	23 50 31.14	4 49	
15	22 19 14.20	12 10 11.9	83.43	15	23 52 26.92	4 38	
16	22 21 12.09	12 1 51.3	83.97	16	23 54 22.70	4 3	
17	22 23 9.91	11 53 27.5	84.52	17	23 56 18.48	4 1	
18	22 25 7.64	11 45 0.4	85.03	18	23 58 14.27	4	
19	22 27 5.30	11 36 30.2	85.58	19	0 0 10.08	3	
20	22 29 2.88	11 27 56.7	86.08	20	0 2 5.89	3	
21	22 31 0.38	11 19 20.2	86.62	21	0 4 1.72	3	
22	22 32 57.81	11 10 40.5	87.12	22	0 5 57.57	3	
23	22 34 55.16	11 1 57.8	87.62	23	0 7 53.43	3	
24	22 36 52.44	S. 10 53 12.1		24	0 9 49.32	S.	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 25.				TUESDAY 27.			
0	h m s	° ' "	"	0	h m s	° ' "	"
0	0 9 49.32	S. 3 5 34.0	104.60	0	1 43 51.07	N. 5 24 51.0	10
1	0 11 45.23	2 55 6.4	104.78	1	1 45 51.42	5 35 22.4	10
2	0 13 41.17	2 44 37.7	104.97	2	1 47 51.93	5 45 52.8	10
3	0 15 37.15	2 34 7.9	105.13	3	1 49 52.60	5 56 22.1	10
4	0 17 33.15	2 23 37.1	105.28	4	1 51 53.45	6 6 50.2	10
5	0 19 29.19	2 13 5.4	105.45	5	1 53 54.47	6 17 17.2	10
6	0 21 25.27	2 2 32.7	105.60	6	1 55 55.67	6 27 42.9	10
7	0 23 21.39	1 51 59.1	105.73	7	1 57 57.04	6 38 7.3	10
8	0 25 17.55	1 41 24.7	105.87	8	1 59 58.60	6 48 30.3	10
9	0 27 13.75	1 30 49.5	106.00	9	2 2 0.34	6 58 52.0	10
10	0 29 10.01	1 20 13.5	106.12	10	2 4 2.26	7 9 12.2	10
11	0 31 6.31	1 9 36.8	106.23	11	2 6 4.38	7 19 30.9	10
12	0 33 2.66	0 58 59.4	106.33	12	2 8 6.69	7 29 48.0	10
13	0 34 59.08	0 48 21.4	106.43	13	2 10 9.20	7 40 3.5	10
14	0 36 55.55	0 37 42.8	106.53	14	2 12 11.90	7 50 17.4	10
15	0 38 52.09	0 27 3.6	106.62	15	2 14 14.81	8 0 29.5	10
16	0 40 48.69	0 16 23.9	106.70	16	2 16 17.92	8 10 39.9	10
17	0 42 45.36	S. 0 5 43.7	106.75	17	2 18 21.25	8 20 48.5	10
18	0 44 42.10	N. 0 4 56.8	106.83	18	2 20 24.78	8 30 55.2	10
19	0 46 38.91	0 15 37.8	106.88	19	2 22 28.52	8 41 0.0	10
20	0 48 35.80	0 26 19.1	106.93	20	2 24 32.48	8 51 2.8	10
21	0 50 32.76	0 37 0.7	106.97	21	2 26 36.67	9 1 3.5	9
22	0 52 29.81	0 47 42.5	107.02	22	2 28 41.07	9 11 2.2	9
23	0 54 26.94	N. 0 58 24.6	107.03	23	2 30 45.70	N. 9 20 58.8	9
MONDAY 26.				WEDNESDAY 28.			
0	0 56 24.15	N. 1 9 6.8	107.05	0	2 32 50.55	N. 9 30 53.1	9
1	0 58 21.46	1 19 49.1	107.07	1	2 34 55.63	9 40 45.2	9
2	1 0 18.86	1 30 31.5	107.08	2	2 37 0.95	9 50 35.0	9
3	1 2 16.35	1 41 14.0	107.07	3	2 39 6.50	10 0 22.4	9
4	1 4 13.95	1 51 56.4	107.07	4	2 41 12.29	10 10 7.4	9
5	1 6 11.64	2 2 38.8	107.03	5	2 43 18.33	10 19 50.0	9
6	1 8 9.44	2 13 21.0	107.02	6	2 45 24.60	10 29 30.0	9
7	1 10 7.35	2 24 3.1	106.98	7	2 47 31.12	10 39 7.4	9
8	1 12 5.37	2 34 45.0	106.95	8	2 49 37.89	10 48 42.1	9
9	1 14 3.50	2 45 26.7	106.90	9	2 51 44.91	10 58 14.2	9
10	1 16 1.75	2 56 8.1	106.83	10	2 53 52.18	11 7 43.5	9
11	1 18 0.12	3 6 49.1	106.78	11	2 55 59.71	11 17 9.9	9
12	1 19 58.60	3 17 29.8	106.70	12	2 58 7.50	11 26 33.5	9
13	1 21 57.22	3 28 10.0	106.63	13	3 0 15.55	11 35 54.1	9
14	1 23 55.96	3 38 49.8	106.53	14	3 2 23.86	11 45 11.7	9
15	1 25 54.83	3 49 29.0	106.45	15	3 4 32.44	11 54 26.3	9
16	1 27 53.84	4 0 7.7	106.35	16	3 6 41.28	12 3 37.7	9
17	1 29 52.98	4 10 45.8	106.23	17	3 8 50.39	12 12 45.9	9
18	1 31 52.27	4 21 23.2	106.12	18	3 10 59.78	12 21 51.0	9
19	1 33 51.69	4 31 59.9	105.98	19	3 13 9.44	12 30 52.7	8
20	1 35 51.27	4 42 35.8	105.85	20	3 15 19.37	12 39 51.0	8
21	1 37 50.99	4 53 10.9	105.72	21	3 17 29.58	12 48 45.9	8
22	1 39 50.86	5 3 45.2	105.57	22	3 19 40.07	12 57 37.3	8
23	1 41 50.89	5 14 18.6	105.40	23	3 21 50.85	13 6 25.2	8
24	1 43 51.07	N. 5 24 51.0		24	3 24 1.90	N. 13 15 9.5	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .
THURSDAY 29.				SATURDAY 31.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	3 24 1.90	N.13 15 9.5	86.77	0	5 14 48.44	N.18 42 53.6	44.77
1	3 26 13.24	13 23 50.1	86.15	1	5 17 14.36	18 47 22.2	43.63
2	3 28 24.87	13 32 27.0	85.52	2	5 19 40.56	18 51 44.0	42.48
3	3 30 36.80	13 41 0.1	84.88	3	5 22 7.05	18 55 58.9	41.33
4	3 32 49.01	13 49 29.4	84.22	4	5 24 33.82	19 0 6.9	40.17
5	3 35 1.51	13 57 54.7	83.55	5	5 27 0.86	19 4 7.9	39.00
6	3 37 14.31	14 6 16.0	82.88	6	5 29 28.19	19 8 1.9	37.82
7	3 39 27.41	14 14 33.3	82.20	7	5 31 55.78	19 11 48.8	36.62
8	3 41 40.81	14 22 46.5	81.48	8	5 34 23.65	19 15 28.5	35.42
9	3 43 54.50	14 30 55.4	80.80	9	5 36 51.79	19 19 1.0	34.20
10	3 46 8.49	14 39 0.2	80.07	10	5 39 20.19	19 22 26.2	32.98
11	3 48 22.79	14 47 0.6	79.35	11	5 41 48.85	19 25 44.1	31.77
12	3 50 37.39	14 54 56.7	78.60	12	5 44 17.77	19 28 54.7	30.53
13	3 52 52.29	15 2 48.3	77.87	13	5 46 46.95	19 31 57.9	29.27
14	3 55 7.50	15 10 35.5	77.08	14	5 49 16.37	19 34 53.5	28.03
15	3 57 23.02	15 18 18.0	76.33	15	5 51 46.05	19 37 41.7	26.77
16	3 59 38.84	15 25 56.0	75.53	16	5 54 15.97	19 40 22.3	25.48
17	4 1 54.97	15 33 29.2	74.75	17	5 56 46.12	19 42 55.2	24.22
18	4 4 11.41	15 40 57.7	73.93	18	5 59 16.52	19 45 20.5	22.93
19	4 6 28.16	15 48 21.3	73.13	19	6 1 47.14	19 47 38.1	21.63
20	4 8 45.21	15 55 40.1	72.28	20	6 4 18.00	19 49 47.9	20.33
21	4 11 2.58	16 2 53.8	71.47	21	6 6 49.07	19 51 49.9	19.03
22	4 13 20.26	16 10 2.6	70.62	22	6 9 20.37	19 53 44.1	17.72
23	4 15 38.25	N.16 17 6.3	69.75	23	6 11 51.87	N.19 55 30.4	16.38
FRIDAY 30.				SUNDAY, SEPT. 1.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	4 17 56.55	N.16 24 4.8	68.88	0	6 14 23.60	N.19 57 8.7	
1	4 20 15.17	16 30 58.1	68.00				
2	4 22 34.09	16 37 46.1	67.10				
3	4 24 53.33	16 44 28.7	66.22				
4	4 27 12.88	16 51 6.0	65.28				
5	4 29 32.74	16 57 37.7	64.37				
6	4 31 52.91	17 4 3.9	63.43				
7	4 34 13.39	17 10 24.5	62.48				
8	4 36 34.19	17 16 39.4	61.53				
9	4 38 55.29	17 22 48.6	60.55				
10	4 41 16.70	17 28 51.9	59.58				
11	4 43 38.42	17 34 49.4	58.60				
12	4 46 0.45	17 40 41.0	57.60				
13	4 48 22.79	17 46 26.6	56.58				
14	4 50 45.44	17 52 6.1	55.57				
15	4 53 8.39	17 57 39.5	54.53				
16	4 55 31.65	18 3 6.7	53.48				
17	4 57 55.21	18 8 27.6	52.43				
18	5 0 19.06	18 13 42.2	51.37				
19	5 2 43.22	18 18 50.4	50.30				
20	5 5 7.68	18 23 52.2	49.22				
21	5 7 32.43	18 28 47.5	48.12				
22	5 9 57.48	18 33 36.2	47.00				
23	5 12 22.81	18 38 18.2	45.90				
24	5 14 48.44	N.18 42 53.6					

## PHASES OF THE MOON.

● New Moon	-	-	d	h	m
☾ First Quarter	-	-	14	5	46.4
○ Full Moon	-	-	22	9	11.7
☾ Last Quarter	-	-	30	2	17.6

☾ Perigee	-	-	-	-	d	h
☾ Apogee	-	-	-	-	7	1
	-	-	-	-	20	3



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	P.L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>	
1	Fomalhaut W.	69 54 46	2863	71 27 52	2841	73 1 26	2820	74 35 28	2798
	α Pegasi W.	55 46 46	3088	57 15 10	3052	58 44 18	3019	60 14 7	2994
	Saturn W.	21 22 22	2599	23 1 18	2580	24 40 41	2561	26 20 30	2541
	SUN E.	86 34 24	2898	85 2 2	2880	83 29 18	2863	81 56 11	2845
2	α Pegasi W.	67 52 57	2840	69 26 33	2814	71 0 42	2789	72 35 24	2764
	Saturn W.	34 46 8	2449	36 28 33	2431	38 11 24	2412	39 54 41	2394
	α Arietis W.	25 10 51	3411	26 32 55	3283	27 57 26	3173	29 24 7	3077
	SUN E.	74 4 42	2752	72 29 11	2734	70 53 16	2715	69 16 56	2696
3	α Pegasi W.	80 36 42	2654	82 14 24	2633	83 52 34	2615	85 31 9	2596
	Saturn W.	48 37 30	2306	50 23 21	2289	52 9 36	2272	53 56 17	2255
	α Arietis W.	37 3 0	2738	38 38 50	2689	40 15 45	2643	41 53 41	2601
	SUN E.	61 9 2	2604	59 30 13	2585	57 50 58	2569	56 11 20	2551
4	Saturn W.	62 55 48	2174	64 44 54	2161	66 34 21	2145	68 24 11	2130
	α Arietis W.	50 16 26	2433	51 59 14	2405	53 42 42	2380	55 26 46	2355
	Aldebaran W.	16 20 3	2175	18 9 9	2159	19 58 38	2144	21 48 30	2130
	SUN E.	47 47 5	2466	46 5 4	2450	44 22 41	2435	42 39 56	2420
5	Saturn W.	77 38 29	2068	79 30 18	2057	81 22 24	2046	83 14 46	2037
	α Arietis W.	64 15 12	2255	66 2 18	2239	67 49 48	2223	69 37 41	2209
	Aldebaran W.	31 2 58	2066	32 54 49	2055	34 46 57	2045	36 39 21	2035
	SUN E.	34 1 5	2353	32 16 22	2341	30 31 23	2330	28 46 7	2320
9	SUN W.	22 40 9	2360	24 24 42	2373	26 8 55	2386	27 52 50	2400
	Spica η E.	42 54 22	2143	41 4 29	2161	39 15 3	2180	37 26 5	2201
	Antares E.	88 48 35	2131	86 58 23	2143	85 8 30	2157	83 18 57	2170
10	SUN W.	36 27 1	2480	38 8 43	2497	39 50 1	2515	41 30 54	2533
	Spica η E.	28 29 57	2335	26 44 49	2372	25 0 34	2414	23 17 19	2462
	Antares E.	74 16 38	2248	72 29 22	2266	70 42 32	2283	68 56 8	2302
11	SUN W.	49 48 58	2627	51 27 17	2646	53 5 9	2666	54 42 35	2686
	Mars W.	16 0 38	2567	17 40 18	2578	19 19 43	2592	20 58 49	2606
	Jupiter W.	14 37 54	2427	16 20 51	2436	18 3 34	2448	19 46 0	2462
	Antares E.	60 11 4	2401	58 27 31	2422	56 44 28	2443	55 1 55	2466
	α Aquilæ E.	106 28 43	2902	104 56 26	2912	103 24 22	2921	101 52 30	2932
12	SUN W.	62 43 5	2785	64 17 52	2805	65 52 13	2825	67 26 8	2845
	Mars W.	29 9 0	2691	30 45 52	2709	32 22 20	2727	33 58 24	2745
	Jupiter W.	28 12 46	2545	29 52 57	2562	31 32 44	2580	33 12 6	2598
	Venus W.	22 54 32	2891	24 27 2	2908	25 59 11	2924	27 30 59	2941
	Antares E.	46 37 15	2585	44 57 59	2611	43 19 19	2637	41 41 14	2664
	α Aquilæ E.	94 17 9	3005	92 47 2	3021	91 17 15	3039	89 47 51	3057
13	SUN W.	75 9 23	2943	76 40 48	2962	78 11 49	2980	79 42 27	2998
	Mars W.	41 52 42	2837	43 26 22	2854	44 59 40	2873	46 32 34	2889
	Jupiter W.	41 22 56	2686	42 59 55	2704	44 36 30	2720	46 12 43	2738
	Venus W.	35 4 30	3031	36 34 5	3048	38 3 18	3066	39 32 9	3084
	α Aquilæ E.	82 26 44	3160	80 59 47	3183	79 33 17	3205	78 7 14	3230
14	SUN W.	87 10 4	3086	88 38 31	3102	90 6 38	3118	91 34 26	3134
	Mars W.	54 11 38	2974	55 42 24	2989	57 12 50	3005	58 42 57	3021
	Jupiter W.	54 8 16	2818	55 42 20	2834	57 16 4	2849	58 49 29	2864



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>h</sup> .	P.L. of diff.	XVIII <sup>h</sup> .	P.L. of diff.	XXI <sup>h</sup> .	P.L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>	
1	Fomalhaut W.	76 9 57	2778	77 44 54	2757	79 20 18	2738	80 56 8	2718
	α Pegasi W.	61 44 37	2955	63 15 46	2925	64 47 33	2896	66 19 57	2868
	Saturn W.	28 0 46	2522	29 41 28	2504	31 22 35	2485	33 4 9	2467
	SUN E.	80 22 41	2826	78 48 47	2808	77 14 29	2790	75 39 48	2771
2	α Pegasi W.	74 10 39	2741	75 46 25	2718	77 22 41	2696	78 59 27	2674
	Saturn W.	41 38 23	2377	43 22 31	2359	45 7 5	2341	46 52 5	2324
	α Arietis W.	30 52 43	2993	32 23 6	2919	33 55 1	2852	35 28 22	2792
	SUN E.	67 40 11	2677	66 3 1	2660	64 25 27	2641	62 47 27	2622
3	α Pegasi W.	87 10 9	2579	88 49 33	2562	90 29 20	2547	92 9 28	2533
	Saturn W.	55 43 23	2239	57 30 53	2222	59 18 48	2206	61 7 6	2190
	α Arietis W.	43 32 35	2563	45 12 21	2527	46 52 57	2494	48 34 19	2462
	SUN E.	54 31 17	2533	52 50 49	2516	51 9 58	2499	49 28 43	2482
4	Saturn W.	70 14 22	2118	72 4 54	2104	73 55 47	2092	75 46 59	2080
	α Arietis W.	57 11 25	2333	58 56 36	2311	60 42 20	2291	62 28 32	2272
	Aldebaran W.	23 38 43	2117	25 29 17	2103	27 20 12	2091	29 11 25	2078
	SUN E.	40 56 50	2405	39 13 23	2391	37 29 36	2378	35 45 30	2365
5	Saturn W.	85 7 23	2027	87 0 15	2019	88 53 19	2010	90 46 37	2003
	α Arietis W.	71 25 55	2196	73 14 28	2184	75 3 19	2174	76 52 26	2164
	Aldebaran W.	38 32 0	2026	40 24 53	2017	42 18 0	2010	44 11 19	2003
	SUN E.	27 0 37	2310	25 14 52	2301	23 28 54	2293	21 42 44	2285
9	SUN W.	29 36 24	2416	31 19 36	2431	33 2 27	2446	34 44 56	2463
	Spica ♀ E.	35 37 39	2223	33 49 46	2247	32 2 29	2275	30 15 52	2303
	Antares E.	81 29 44	2184	79 40 53	2199	77 52 24	2215	76 4 19	2231
10	SUN W.	43 11 22	2551	44 51 25	2569	46 31 2	2588	48 10 13	2607
	Spica ♀ E.	21 35 12	2517	19 54 23	2585	18 15 8	2669	16 37 46	2776
	Antares E.	67 10 11	2320	65 24 41	2340	63 39 40	2360	61 55 8	2380
11	SUN W.	56 19 34	2705	57 56 7	2725	59 32 13	2746	61 7 52	2766
	Mars W.	22 37 36	2622	24 16 1	2638	25 54 4	2655	27 31 44	2673
	Jupiter W.	21 28 6	2478	23 9 50	2494	24 51 12	2510	26 32 11	2527
	Antares E.	53 19 54	2489	51 38 25	2512	49 57 29	2538	48 17 5	2560
	α Aquilæ E.	100 20 52	2945	98 49 30	2958	97 18 24	2973	95 47 37	2988
12	SUN W.	68 59 37	2866	70 32 40	2884	72 5 19	2904	73 37 33	2923
	Mars W.	35 34 4	2764	37 9 19	2782	38 44 11	2801	40 18 38	2818
	Jupiter W.	34 51 4	2615	36 29 38	2633	38 7 48	2651	39 45 34	2668
	Venus W.	29 2 26	2989	30 33 30	2977	32 4 12	2994	33 34 32	3001
	Antares E.	40 3 46	2693	38 26 57	2722	36 50 46	2753	35 15 1	2783
	α Aquilæ E.	88 18 49	3077	86 50 11	3096	85 21 57	3117	83 54	3137
13	SUN W.	81 12 43	3016	82 42 36	3035	84 12 6	3052	85 41	3071
	Mars W.	48 5 7	2905	49 37 17	2924	51 9 5	2941	52 4	2960
	Jupiter W.	47 48 33	2754	49 24 1	2771	50 59 7	2787	52	2806
	Venus W.	41 0 38	3101	42 28 46	3119	43 56 33	3135	45	3151
	α Aquilæ E.	76 41 40	3253	75 16 34	3278	73 51 57	3304	72	3329
14	SUN W.	93 1 54	3149	94 29 4	3164	95 55 56	3179	9	3194
	Mars W.	60 12 44	3035	61 42 14	3050	63 11 25	3064	(	3079
	Jupiter W.	60 22 34	2878	61 55 21	2892	63 27 50	2906	(	2921



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
14	Venus W.	46 51 6	3169	48 17 52	3185	49 44 19	3201	51 10 27
	Spica $\eta$ W.	27 38 39	2890	29 11 11	2892	30 43 40	2895	32 16 52
	$\alpha$ Aquilæ E.	71 4 14	3358	69 41 9	3386	68 18 37	3415	66 56 37
15	Sun W.	98 48 47	3208	100 14 47	3220	101 40 32	3234	103 6 12
	Jupiter W.	66 31 56	2931	68 3 35	2945	69 34 57	2957	71 6 42
	Mars W.	66 8 56	3091	67 37 17	3105	69 5 21	3117	70 33 10
	Venus W.	58 16 35	3289	59 40 59	3304	61 5 6	3316	62 28 59
	Spica $\eta$ W.	39 56 20	2934	41 27 56	2942	42 59 21	2950	44 30 37
	$\alpha$ Aquilæ E.	60 15 21	3611	58 56 58	3649	57 39 16	3687	56 22 15
	Fomalhaut E.	92 27 6	3115	90 59 14	3127	89 31 37	3139	88 4 15
16	Sun W.	110 9 52	3303	111 34 0	3314	112 57 55	3324	114 21 39
	Jupiter W.	78 38 6	3022	80 7 52	3031	81 37 26	3040	83 6 49
	Mars W.	77 48 44	3185	79 15 11	3194	80 41 28	3204	82 7 32
	Venus W.	69 24 51	3386	70 47 23	3397	72 9 43	3407	73 31 52
	Spica $\eta$ W.	52 4 23	2997	53 34 40	3005	55 4 47	3012	56 34 45
	Fomalhaut E.	80 51 1	3211	79 25 5	3224	77 59 24	3235	76 33 56
17	Sun W.	121 17 49	3373	122 40 36	3380	124 3 15	3386	125 25 47
	Jupiter W.	90 31 11	3087	91 59 37	3093	93 27 55	3099	94 56 6
	Mars W.	89 15 25	3253	90 40 32	3259	92 5 32	3265	93 30 25
	Venus W.	80 20 9	3456	81 41 22	3463	83 2 27	3470	84 23 25
	Spica $\eta$ W.	64 2 33	3050	65 31 44	3055	67 0 49	3061	68 29 47
	Fomalhaut E.	69 30 10	3308	68 6 8	3320	66 42 20	3333	65 18 47
	$\alpha$ Pegasi E.	84 46 10	3359	83 23 6	3368	82 0 13	3376	80 37 29
	Saturn E.	115 22 29	3006	113 52 23	3012	112 22 25	3018	110 52 34
18	Sun W.	132 16 51	3417	133 38 48	3421	135 0 41	3424	136 22 30
	Jupiter W.	102 15 24	3128	103 43 0	3131	105 10 32	3134	106 38 0
	Mars W.	100 33 12	3295	101 57 29	3299	103 21 42	3301	104 45 52
	Venus W.	91 6 39	3501	92 27 2	3505	93 47 21	3508	95 7 36
	Spica $\eta$ W.	75 53 21	3084	77 21 50	3087	78 50 16	3090	80 18 38
	Antares W.	30 47 0	3276	32 11 40	3260	33 36 38	3248	35 1 50
	Fomalhaut E.	58 24 55	3417	57 2 58	3434	55 41 20	3450	54 20 0
	$\alpha$ Pegasi E.	73 46 18	3429	72 24 34	3439	71 3 2	3449	69 41 41
	Saturn E.	103 24 47	3044	101 55 29	3047	100 26 15	3051	98 57 5
19	Mars W.	111 45 51	3316	113 9 44	3317	114 33 36	3319	115 57 26
	Venus W.	101 48 4	3523	103 8 3	3524	104 28 1	3525	105 47 57
	Spica $\eta$ W.	87 39 51	3100	89 8 0	3102	90 36 7	3102	92 4 14
	Antares W.	42 10 38	3198	43 36 49	3192	45 3 8	3187	46 29 33
	$\alpha$ Pegasi E.	62 58 0	3518	61 37 56	3532	60 18 7	3547	58 58 33
	Saturn E.	91 31 53	3062	90 2 57	3062	88 34 1	3063	87 5 6
20	Venus W.	112 27 31	3525	113 47 27	3525	115 7 23	3524	116 27 21
	Antares W.	53 43 5	3159	55 10 3	3155	56 37 6	3150	58 4 15
	$\alpha$ Pegasi E.	52 25 29	3653	51 7 57	3682	49 50 51	3708	48 34 13
	Saturn E.	79 40 33	3062	78 11 37	3061	76 42 39	3059	75 13 39
	$\alpha$ Arietis E.	94 9 42	3224	92 44 1	3223	91 18 19	3221	89 52 35
21	Antares W.	65 21 12	3126	66 48 50	3121	68 16 34	3118	69 44 22
	$\alpha$ Pegasi E.	42 19 30	3927	41 6 38	3978	39 54 37	4036	38 43 33
	Saturn E.	67 48 9	3048	66 18 55	3044	64 49 37	3042	63 20 16



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
14	Venus W.	52 36 16	3232	54 1 47	3247	55 27 0	3262	56 51 56	3277
	Spica $\pi\eta$ W.	33 48 24	2905	35 20 36	2912	36 52 40	2919	38 24 35	2927
	$\alpha$ Aquilæ E.	65 35 10	3475	64 14 18	3507	62 54 2	3541	61 34 23	3575
15	SUN W.	104 31 15	3259	105 56 15	3271	107 21 0	3282	108 45 33	3294
	Jupiter W.	72 36 56	2980	74 7 34	2991	75 37 58	3002	77 8 9	3013
	Mars W.	72 0 45	3141	73 28 5	3153	74 55 11	3163	76 22 4	3174
	Venus W.	63 52 37	3342	65 16 0	3353	66 39 10	3365	68 2 7	3376
	Spica $\pi\eta$ W.	46 1 42	2966	47 32 37	2974	49 3 22	2981	50 33 58	2990
	$\alpha$ Aquilæ E.	55 5 58	3771	53 50 26	3818	52 35 42	3866	51 21 48	3917
	Fomalhaut E.	86 37 7	3163	85 10 14	3176	83 43 36	3187	82 17 11	3199
16	SUN W.	115 45 13	3342	117 8 36	3351	118 31 49	3359	119 54 53	3365
	Jupiter W.	84 36 1	3057	86 5 3	3065	87 33 55	3074	89 2 37	3080
	Mars W.	83 33 26	3221	84 59 10	3230	86 24 44	3237	87 50 9	3245
	Venus W.	74 53 51	3424	76 15 40	3433	77 37 19	3442	78 58 48	3449
	Spica $\pi\eta$ W.	58 4 34	3026	59 34 15	3031	61 3 49	3038	62 33 14	3043
	Fomalhaut E.	75 8 43	3259	73 43 43	3271	72 18 58	3283	70 54 27	3295
17	SUN W.	126 48 12	3399	128 10 30	3403	129 32 43	3408	130 54 50	3414
	Jupiter W.	96 24 9	3110	97 52 7	3115	99 19 58	3119	100 47 44	3124
	Mars W.	94 55 10	3277	96 19 49	3282	97 44 22	3287	99 8 49	3290
	Venus W.	85 44 15	3481	87 5 0	3488	88 25 38	3492	89 46 11	3497
	Spica $\pi\eta$ W.	69 58 40	3069	71 27 28	3074	72 56 10	3077	74 24 48	3081
	Fomalhaut E.	63 55 29	3359	62 32 26	3374	61 9 40	3387	59 47 9	3402
	$\alpha$ Pegasi E.	79 14 54	3393	77 52 30	3402	76 30 16	3410	75 8 11	3421
	Saturn E.	109 22 49	3028	107 53 11	3032	106 23 38	3036	104 54 10	3040
18	SUN W.	137 44 15	3431	139 5 57	3433	140 27 36	3436	141 49 13	3437
	Jupiter W.	108 5 24	3140	109 32 45	3143	111 0 3	3144	112 27 19	3146
	Mars W.	106 9 57	3308	107 33 59	3310	108 57 59	3313	110 21 56	3314
	Venus W.	96 27 47	3515	97 47 55	3516	99 8 1	3520	100 28 3	3521
	Spica $\pi\eta$ W.	81 46 57	3094	83 15 14	3096	84 43 28	3098	86 11 40	3099
	Antares W.	36 27 15	3227	37 52 52	3219	39 18 38	3211	40 44 34	3204
	Fomalhaut E.	52 59 1	3487	51 38 22	3506	50 18 5	3527	48 58 11	3551
	$\alpha$ Pegasi E.	68 20 32	3471	66 59 35	3481	65 38 50	3493	64 18 18	3506
	Saturn E.	97 27 57	3056	95 58 53	3057	94 29 51	3059	93 0 51	3061
19	Mars W.	117 21 16	3313	118 45 5	3319	120 8 54	3320	121 32 42	3319
	Venus W.	107 7 52	3526	108 27 47	3526	109 47 42	3526	111 7 37	3527
	Spica $\pi\eta$ W.	93 32 21	3103	95 0 27	3103	96 28 33	3103	97 56 39	3102
	Antares W.	47 56 4	3177	49 22 41	3173	50 49 23	3168	52 16 11	3163
	$\alpha$ Pegasi E.	57 39 19	3578	56 20 21	3597	55 1 43	3615	53 43 25	3636
	Saturn E.	85 36 12	3064	84 7 18	3064	82 38 24	3063	81 9 29	3062
20	Venus W.	117 47 20	3522	119 7 20	3521	120 27 21	3519	121 47 24	3517
	Antares W.	59 31 28	3142	60 58 47	3138	62 26 10	3134	63 53 38	3129
	$\alpha$ Pegasi E.	47 18 5	3768	46 2 29	3802	44 47 29	3840	43 33 8	3887
	Saturn E.	73 44 38	3056	72 15 34	3055	70 46 29	3052	69 17 20	3051
	$\alpha$ Arietis E.	88 26 49	3219	87 1 2	3217	85 35 13	3215	84 9 22	3211
21	Antares W.	71 12 16	3109	72 40 15	3105	74 8 19	3100	75 36 29	3097
	$\alpha$ Pegasi E.	37 33 31	4171	36 24 37	4250	35 16 58	4341	34 10 43	4431
	Saturn E.	61 50 52	3036	60 21 24	3032	58 51 51	3030	57 22 15	3027



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	P.L. of diff.
		° ' "		° ' "		° ' "		° ' "	
21	α Arietis E.	82 43 29	3212	81 17 34	3211	79 51 38	3210	78 25 41	3208
22	Antares W.	77 4 44	3091	78 33 5	3087	80 1 31	3082	81 30 3	3078
	α Aquilæ W.	38 35 51	4752	39 36 7	4641	40 37 57	4539	41 41 15	4445
	Saturn E.	55 52 34	3022	54 22 48	3018	52 52 58	3014	51 23 2	3010
	α Arietis E.	71 15 31	3204	69 49 26	3203	68 23 21	3202	66 57 14	3201
23	Antares W.	88 54 10	3053	90 23 17	3048	91 52 30	3043	93 21 50	3038
	α Aquilæ W.	47 16 23	4089	48 26 35	4034	49 37 41	3983	50 49 37	3931
	Saturn E.	43 52 8	2988	42 21 40	2983	40 51 6	2979	39 20 27	2974
	α Arietis E.	59 46 47	3206	58 20 45	3209	56 54 46	3210	55 28 49	3214
	Aldebaran E.	90 46 20	2995	89 16 1	2989	87 45 35	2984	86 15 2	2979
24	α Aquilæ W.	57 0 20	3742	58 16 23	3710	59 33 0	3680	60 50 8	3651
	Saturn E.	31 45 36	2949	30 14 19	2944	28 42 56	2939	27 11 26	2934
	α Arietis E.	48 20 18	3241	46 54 58	3250	45 29 48	3259	44 4 49	3272
	Aldebaran E.	78 40 37	2951	77 9 23	2944	75 38 0	2939	74 6 30	2932
25	α Aquilæ W.	67 22 54	3532	68 42 43	3512	70 2 54	3492	71 23 27	3473
	Fomalhaut W.	33 16 53	3860	34 30 53	3779	35 46 17	3708	37 2 56	3643
	α Arietis E.	37 4 16	3366	35 41 21	3397	34 19 1	3431	32 57 19	3471
	Aldebaran E.	66 26 54	2898	64 54 33	2891	63 22 2	2884	61 49 22	2877
26	α Aquilæ W.	78 11 5	3393	79 33 30	3379	80 56 11	3365	82 19 7	3352
	Fomalhaut W.	43 41 45	3395	45 4 7	3358	46 27 12	3322	47 50 58	3288
	α Pegasi W.	32 15 50	4335	33 22 10	4205	34 30 31	4090	35 40 42	3986
	Aldebaran E.	54 3 33	2835	52 29 51	2828	50 55 59	2818	49 21 55	2810
	SUN E.	139 12 33	3188	137 46 9	3177	136 19 32	3167	134 52 44	3158
27	Fomalhaut W.	54 58 53	3148	56 26 5	3124	57 53 45	3101	59 21 54	3078
	α Pegasi W.	41 54 32	3599	43 13 7	3542	44 32 45	3488	45 53 23	3438
	Aldebaran E.	41 28 37	2763	39 53 20	2752	38 17 49	2742	36 42 5	2732
	Pollux E.	85 44 14	2812	84 10 2	2803	82 35 38	2793	81 1 1	2783
	SUN E.	127 35 45	3106	126 7 43	3096	124 39 28	3084	123 10 59	3073
28	Fomalhaut W.	66 49 7	2978	68 19 47	2960	69 50 50	2943	71 22 15	2924
	α Pegasi W.	52 49 29	3234	54 14 58	3199	55 41 8	3167	57 7 56	3137
	Pollux E.	73 4 37	2732	71 28 39	2722	69 52 28	2710	68 16 1	2700
	SUN E.	115 45 2	3014	114 15 7	3001	112 44 55	2988	111 14 27	2976
29	Fomalhaut W.	79 4 47	2842	80 38 20	2826	82 12 14	2811	83 46 26	2797
	α Pegasi W.	64 30 42	3002	66 0 52	2979	67 31 31	2955	69 2 40	2934
	Saturn W.	31 40 20	2573	33 19 52	2560	34 59 42	2546	36 39 51	2532
	Pollux E.	60 10 17	2646	58 32 25	2636	56 54 19	2626	55 15 59	2615
	SUN E.	103 38 2	2908	102 5 53	2894	100 33 27	2880	99 0 42	2866
30	Saturn W.	45 5 33	2461	46 47 41	2447	48 30 9	2433	50 12 57	2418
	α Arietis W.	33 18 43	3003	34 48 52	2946	36 20 13	2894	37 52 40	2846
	Pollux E.	47 0 53	2568	45 21 14	2560	43 41 24	2553	42 1 25	2546
	SUN E.	91 12 19	2792	89 37 41	2778	88 2 44	2763	86 27 27	2747
31	Saturn W.	58 52 7	2346	60 36 59	2332	62 22 12	2318	64 7 45	2304
	α Arietis W.	45 48 50	2658	47 26 26	2627	49 4 44	2599	50 43 41	2572
	Pollux E.	33 39 44	2535	31 59 19	2538	30 18 59	2546	28 38 50	2558
	SUN E.	78 26 0	2672	76 48 42	2657	75 11 4	2642	73 33 6	2627



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>	
21	α Arietis E.	76 59 41	3208	75 33 41	3206	74 7 39	3205	72 41 36	3204
22	Antares W.	82 58 40	3072	84 27 24	3068	85 56 13	3063	87 25 8	3057
	α Aquilæ W.	42 45 55	4363	43 51 50	4286	44 58 56	4214	46 7 9	4150
	Saturn E.	49 53 2	3006	48 22 57	3002	46 52 46	2997	45 22 29	2993
	α Arietis E.	65 31 8	3203	64 5 2	3203	62 38 56	3204	61 12 51	3204
23	Antares W.	94 51 16	3032	96 20 49	3027	97 50 28	3022	99 20 13	3017
	α Aquilæ W.	52 2 21	3891	53 15 50	3849	54 30 1	3811	55 44 52	3775
	Saturn E.	37 49 41	2969	36 18 49	2964	34 47 51	2959	33 16 47	2954
	α Arietis E.	54 2 56	3218	52 37 8	3222	51 11 25	3227	49 45 48	3233
	Aldebaran E.	84 44 23	2974	83 13 37	2969	81 42 45	2962	80 11 45	2956
24	α Aquilæ W.	62 7 47	3625	63 25 54	3599	64 44 29	3576	66 3 29	3554
	Saturn E.	25 39 50	2929	24 8 8	2924	22 36 20	2920	21 4 27	2916
	α Arietis E.	42 40 5	3285	41 15 36	3302	39 51 27	3320	38 27 39	3342
	Aldebaran E.	72 34 52	2925	71 3 5	2919	69 31 10	2913	67 59 7	2905
25	α Aquilæ W.	72 44 21	3456	74 5 34	3439	75 27 7	3423	76 48 57	3408
	Fomalhaut W.	38 20 44	3584	39 39 36	3531	40 59 26	3482	42 20 10	3437
	α Arietis E.	31 36 22	3518	30 16 18	3573	28 57 14	3639	27 39 22	3718
	Aldebaran E.	60 16 33	2868	58 43 33	2860	57 10 23	2852	55 37 3	2845
26	α Aquilæ W.	83 42 18	3339	85 5 44	3328	86 29 23	3317	87 53 15	3306
	Fomalhaut W.	49 15 24	3257	50 40 26	3228	52 6 2	3199	53 32 12	3173
	α Pegasi W.	36 52 35	3893	38 6 2	3810	39 20 54	3733	40 37 6	3663
	Aldebaran E.	47 47 40	2800	46 13 12	2792	44 38 33	2782	43 3 41	2772
	SUN E.	133 25 45	3148	131 58 33	3138	130 31 10	3127	129 3 33	3118
27	Fomalhaut W.	60 50 30	3057	62 19 32	3037	63 48 59	3017	65 18 51	2998
	α Pegasi W.	47 14 57	3392	48 37 23	3348	50 0 39	3307	51 24 42	3270
	Aldebaran E.	35 6 8	2721	33 29 56	2711	31 53 30	2699	30 16 49	2688
	Pollux E.	79 26 11	2773	77 51 8	2763	76 15 52	2752	74 40 21	2742
	SUN E.	121 42 17	3061	120 13 20	3050	118 44 9	3038	117 14 43	3026
28	Fomalhaut W.	72 54 3	2908	74 26 12	2891	75 58 43	2874	77 31 35	2859
	α Pegasi W.	58 35 21	3107	60 3 22	3080	61 31 56	3053	63 1 3	3027
	Pollux E.	66 39 21	2690	65 2 27	2678	63 25 18	2668	61 47 55	2657
	SUN E.	109 43 44	2962	108 12 44	2949	106 41 27	2935	105 9 53	2922
29	Fomalhaut W.	85 20 59	2782	86 55 51	2768	88 31 1	2753	90 6 31	2740
	α Pegasi W.	70 34 16	2912	72 6 20	2891	73 38 51	2871	75 11 47	2852
	Saturn W.	38 20 20	2517	40 1 9	2504	41 42 17	2490	43 23 45	2475
	Pollux E.	53 37 24	2605	51 58 36	2595	50 19 34	2586	48 40 20	2577
	SUN E.	97 27 39	2851	95 54 17	2837	94 20 37	2822	92 46 38	2807
30	Saturn W.	51 56 6	2403	53 39 36	2390	55 23 25	2375	57 7 36	2361
	α Arietis W.	39 26 8	2802	41 0 33	2763	42 35 50	2725	44 11 57	2690
	Pollux E.	40 21 16	2540	38 40 59	2537	37 0 37	2534	35 20 11	2533
	SUN E.	84 51 49	2732	83 15 52	2717	81 39 35	2702	80 2 58	2687
31	Saturn W.	65 53 39	2290	67 39 53	2276	69 26 28	2262	71 13 23	2249
	α Arietis W.	52 23 15	2546	54 3 25	2521	55 44 9	2497	57 25 26	2476
	Pollux E.	26 58 57	2575	25 19 28	2600	23 40 33	2634	22 2 24	2681
	SUN E.	71 54 48	2613	70 16 10	2597	68 37 11	2583	66 57 53	2569



# CONFIGURATIONS OF THE SATELLITES OF JUPITER,

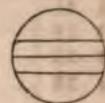
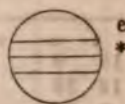
At 8<sup>h</sup>, MEAN TIME.

Day of the Month.	West.				East.			
1	4.		1	○	2.	3.		
2	.4		2.	○	3.			○ 1.
3	.4		3.	2	○	1		
4		.4 3.	1.	○		2		
5			.3 .4	○	2.	1.		
6			.2 .1	○	4			● .3
7	.2 ●			○	1.	.4 .3		
8			1	○	2.	3.	.4	
9			2.	○	1.	3.		.4
10	.1 ●		.2 3.	○				.4
11		3.	1.	○	2			4.
12		.3		○	2. 1		4.	
13			2.	.1 .3	○		4.	
14	.2 ●			○	4.	1.	.3	
15			4.	1	○	2.	3.	
16		4.	2.	○	1.	3.		
17		4.	.2 3.	○				● .1
18	4.	3.	1.	○	2			
19	.4	.3		○	.12.			
20	.4		2.	1. <sup>3</sup>	○			
21		.4		.2	○	1.	.3	
22			.4 .1	○		2.	.3	
23	.4 ●		2.	○	1.	3.		
24	3. ○		.2	1	○	.4		
25	1. ○	3.		○	.2		.4	
26		.3		○	.1 2.		.4	
27			2. 3 1.	○			4.	
28			.2	○	.3 1		4.	
29			.1	○		.2 .3	4.	
30	2. ○			○	1.	3. 4.		
31			.2 .1	○	3. 4.			

This Table represents, at 8<sup>h</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the page; the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of the Satellites' motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite placed by the side of it is on the disc of Jupiter, and a black circle (●) that it is either *behind* the disc, or in the shadow, of Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

TELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.	1	12 26 17.8	21 7 17.3	Em.
	3	6 55 1.0	15 42 59.3	Em.
	5	1 23 38.3	10 18 35.3	Em.
	6	19 52 19.6	4 54 15.3	Em.
	8	14 20 55.8	23 29 50.1	Em.
	10	8 49 38.5	18 5 31.5	Em.
	12	3 18 15.4	12 41 7.0	Em.
	13	21 46 56.1	7 16 46.4	Em.
	15	16 15 31.4	1 52 20.4	Em.
	17	10 44 13.4	20 28 1.1	Em.
	19	5 12 49.5	15 3 35.9	Em.
	20	23 41 29.7	9 39 14.8	Em.
	22	18 10 4.3	4 14 48.0	Em.
	24	12 38 45.6	22 50 27.9	Em.
	26†	7 7 21.1	17 26 2.2	Em.
	28	1 36 0.5	12 1 40.2	Em.
	29	20 4 34.3	6 37 12.7	Em.
	31	14 33 14.7	1 12 51.8	Em.
II.	3	19 3 19.4	3 53 17.4	Em.
	7†	8 20 49.7	17 24 48.3	Em.
	10	21 38 32.3	6 56 31.6	Em.
	14	10 55 57.8	20 27 57.7	Em.
	18	0 13 32.5	9 59 33.1	Em.
	21	13 30 52.8	23 30 54.1	Em.
	25	2 48 19.4	13 2 21.3	Em.
	28	16 5 35.2	2 33 37.8	Em.
III.	6	10 27 8.4	19 27 31.2	Im.
	6	13 25 0.3	22 25 52.3	Em.
	13	17 22 51.7	2 51 58.7	Em.
	20	21 21 6.2	7 18 28.2	Em.
	28	1 19 10.5	11 44 47.4	Em.
IV.	6	16 37 52.4	1 39 16.1	Im.
	6	18 45 0.6	3 46 45.2	Em.
	23	10 42 24.3	20 49 51.1	Im.
	23	12 35 27.2	22 43 12.5	Em.







Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>d</sup> .629573. Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	+1.0741	-1.1988	+9.5549	+0.8221	<sup>h</sup> 15 <sup>m</sup> 18 <sup>s</sup> 32.11	131	212	.580
2	1.0829	1.1928	9.5581	0.8205	15 14 36.21	132	213	.583
3	1.0913	1.1865	9.5612	0.8189	15 10 40.30	133	214	.586
4	+1.0995	-1.1801	+9.5643	+0.8173	15 6 44.39	134	215	.589
5	1.1073	1.1734	9.5673	0.8156	15 2 48.48	135	216	.591
6	1.1150	1.1665	9.5703	0.8140	14 58 52.57	136	217	.594
7	+1.1224	-1.1593	+9.5733	+0.8124	14 54 56.66	137	218	.597
8	1.1295	1.1519	9.5762	0.8108	14 51 0.75	138	219	.600
9	1.1364	1.1442	9.5790	0.8091	14 47 4.84	139	220	.602
10	+1.1431	-1.1363	+9.5818	+0.8075	14 43 8.94	140	221	.605
11	1.1496	1.1281	9.5845	0.8058	14 39 13.03	141	222	.608
12	1.1559	1.1195	9.5872	0.8041	14 35 17.12	142	223	.611
13	+1.1619	-1.1108	+9.5899	+0.8025	14 31 21.21	143	224	.613
14	1.1677	1.1017	9.5925	0.8008	14 27 25.30	144	225	.616
15	1.1734	1.0923	9.5951	0.7992	14 23 29.39	145	226	.619
16	+1.1788	-1.0826	+9.5976	+0.7975	14 19 33.49	146	227	.621
17	1.1841	1.0725	9.6000	0.7959	14 15 37.58	147	228	.624
18	1.1892	1.0620	9.6024	0.7943	14 11 41.67	148	229	.627
19	+1.1941	-1.0512	+9.6048	+0.7926	14 7 45.76	149	230	.630
20	1.1988	1.0399	9.6071	0.7910	14 3 49.85	150	231	.632
21	1.2034	1.0282	9.6095	0.7894	13 59 53.95	151	232	.635
22	+1.2078	-1.0160	+9.6117	+0.7878	13 55 58.04	152	233	.638
23	1.2120	1.0034	9.6139	0.7862	13 52 2.13	153	234	.641
24	1.2161	0.9903	9.6161	0.7847	13 48 6.22	154	235	.643
25	+1.2200	-0.9766	+9.6183	+0.7831	13 44 10.32	155	236	.646
26	1.2237	0.9623	9.6204	0.7816	13 40 14.41	156	237	.649
27	1.2273	0.9474	9.6225	0.7801	13 36 18.50	157	238	.652
28	+1.2308	-0.9318	+9.6245	+0.7786	13 32 22.59	158	239	.654
29	1.2341	0.9156	9.6265	0.7772	13 28 26.69	159	240	.657
30	1.2372	0.8985	9.6285	0.7757	13 24 30.78	160	241	.660
31	1.2403	0.8807	9.6305	0.7743	13 20 34.87	161	242	.663
32	+1.2431	-0.8619	+9.6324	+0.7729	13 16 38.97	162	243	.665



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>"</sup>
Sun.	1	10 41 4 <sup>1</sup> 7	9 <sup>0</sup> 72	N. 8 20 5 <sup>3</sup>	54 <sup>6</sup> 1	1 4 <sup>3</sup> 35	0 5 <sup>9</sup> 7	0 <sup>7</sup> 8
Mon.	2	10 44 41 <sup>9</sup> 1	9 <sup>0</sup> 61	7 58 14 <sup>6</sup>	54 <sup>9</sup> 4	1 4 <sup>3</sup> 31	0 24 <sup>7</sup> 4	0 <sup>7</sup> 9
Tues.	3	10 48 19 <sup>3</sup> 8	9 <sup>0</sup> 50	7 36 16 <sup>1</sup>	55 <sup>2</sup> 5	1 4 <sup>3</sup> 27	0 43 <sup>7</sup> 8	0 <sup>8</sup> 0
Wed.	4	10 51 56 <sup>5</sup> 9	9 <sup>0</sup> 41	7 14 10 <sup>1</sup>	55 <sup>5</sup> 5	1 4 <sup>3</sup> 24	1 3 <sup>0</sup> 6	0 <sup>8</sup> 1
Thur.	5	10 55 33 <sup>5</sup> 7	9 <sup>0</sup> 31	6 51 57 <sup>0</sup>	55 <sup>8</sup> 3	1 4 <sup>3</sup> 20	1 22 <sup>5</sup> 8	0 <sup>8</sup> 2
Frid.	6	10 59 10 <sup>3</sup> 2	9 <sup>0</sup> 22	6 29 37 <sup>1</sup>	56 <sup>1</sup> 0	1 4 <sup>3</sup> 17	1 42 <sup>3</sup> 3	0 <sup>8</sup> 3
Sat.	7	11 2 46 <sup>8</sup> 6	9 <sup>0</sup> 14	6 7 10 <sup>7</sup>	56 <sup>3</sup> 5	1 4 <sup>3</sup> 14	2 2 <sup>2</sup> 9	0 <sup>8</sup> 4
Sun.	8	11 6 23 <sup>2</sup> 0	9 <sup>0</sup> 07	5 44 38 <sup>2</sup>	56 <sup>5</sup> 9	1 4 <sup>3</sup> 11	2 22 <sup>4</sup> 4	0 <sup>8</sup> 4
Mon.	9	11 9 59 <sup>3</sup> 6	9 <sup>0</sup> 00	5 22 0 <sup>0</sup>	56 <sup>8</sup> 2	1 4 <sup>3</sup> 08	2 42 <sup>7</sup> 8	0 <sup>8</sup> 5
Tues.	10	11 13 35 <sup>3</sup> 6	8 <sup>9</sup> 93	4 59 16 <sup>4</sup>	57 <sup>0</sup> 3	1 4 <sup>3</sup> 06	3 3 <sup>2</sup> 8	0 <sup>8</sup> 6
Wed.	11	11 17 11 <sup>2</sup> 0	8 <sup>9</sup> 88	4 36 27 <sup>7</sup>	57 <sup>2</sup> 3	1 4 <sup>3</sup> 04	3 23 <sup>9</sup> 4	0 <sup>8</sup> 6
Thur.	12	11 20 46 <sup>9</sup> 1	8 <sup>9</sup> 83	4 13 34 <sup>2</sup>	57 <sup>4</sup> 1	1 4 <sup>3</sup> 03	3 44 <sup>7</sup> 2	0 <sup>8</sup> 7
Frid.	13	11 24 22 <sup>5</sup> 1	8 <sup>9</sup> 79	3 50 36 <sup>4</sup>	57 <sup>5</sup> 7	1 4 <sup>3</sup> 02	4 5 <sup>6</sup> 1	0 <sup>8</sup> 7
Sat.	14	11 27 58 <sup>0</sup> 1	8 <sup>9</sup> 76	3 27 34 <sup>6</sup>	57 <sup>7</sup> 3	1 4 <sup>3</sup> 01	4 26 <sup>6</sup> 1	0 <sup>8</sup> 7
Sun.	15	11 31 33 <sup>4</sup> 3	8 <sup>9</sup> 73	3 4 29 <sup>1</sup>	57 <sup>8</sup> 7	1 4 <sup>3</sup> 00	4 47 <sup>6</sup> 9	0 <sup>8</sup> 8
Mon.	16	11 35 8 <sup>7</sup> 9	8 <sup>9</sup> 72	2 41 20 <sup>2</sup>	58 <sup>0</sup> 0	1 4 <sup>3</sup> 00	5 8 <sup>8</sup> 2	0 <sup>8</sup> 8
Tues.	17	11 38 44 <sup>1</sup> 2	8 <sup>9</sup> 72	2 18 8 <sup>2</sup>	58 <sup>1</sup> 1	1 4 <sup>3</sup> 00	5 29 <sup>9</sup> 8	0 <sup>8</sup> 8
Wed.	18	11 42 19 <sup>4</sup> 4	8 <sup>9</sup> 72	1 54 53 <sup>5</sup>	58 <sup>2</sup> 1	1 4 <sup>3</sup> 00	5 51 <sup>1</sup> 5	0 <sup>8</sup> 8
Thur.	19	11 45 54 <sup>7</sup> 7	8 <sup>9</sup> 74	1 31 36 <sup>4</sup>	58 <sup>3</sup> 0	1 4 <sup>3</sup> 01	6 12 <sup>3</sup> 1	0 <sup>8</sup> 8
Frid.	20	11 49 30 <sup>1</sup> 4	8 <sup>9</sup> 76	1 8 17 <sup>3</sup>	58 <sup>3</sup> 7	1 4 <sup>3</sup> 02	6 33 <sup>4</sup> 4	0 <sup>8</sup> 7
Sat.	21	11 53 5 <sup>5</sup> 7	8 <sup>9</sup> 80	0 44 56 <sup>4</sup>	58 <sup>4</sup> 3	1 4 <sup>3</sup> 03	6 54 <sup>5</sup> 0	0 <sup>8</sup> 7
Sun.	22	11 56 41 <sup>0</sup> 9	8 <sup>9</sup> 84	N. 0 21 34 <sup>1</sup>	58 <sup>4</sup> 8	1 4 <sup>3</sup> 04	7 15 <sup>4</sup> 8	0 <sup>8</sup> 7
Mon.	23	12 0 16 <sup>7</sup> 1	8 <sup>9</sup> 90	S. 0 1 49 <sup>4</sup>	58 <sup>5</sup> 1	1 4 <sup>3</sup> 05	7 36 <sup>3</sup> 6	0 <sup>8</sup> 6
Tues.	24	12 3 52 <sup>4</sup> 6	8 <sup>9</sup> 96	0 25 13 <sup>6</sup>	58 <sup>5</sup> 3	1 4 <sup>3</sup> 07	7 57 <sup>1</sup> 0	0 <sup>8</sup> 5
Wed.	25	12 7 28 <sup>3</sup> 7	9 <sup>0</sup> 04	0 48 38 <sup>3</sup>	58 <sup>5</sup> 4	1 4 <sup>3</sup> 09	8 17 <sup>6</sup> 9	0 <sup>8</sup> 5
Thur.	26	12 11 4 <sup>4</sup> 6	9 <sup>0</sup> 12	1 12 3 <sup>2</sup>	58 <sup>5</sup> 3	1 4 <sup>3</sup> 12	8 38 <sup>0</sup> 9	0 <sup>8</sup> 4
Frid.	27	12 14 40 <sup>7</sup> 5	9 <sup>0</sup> 21	1 35 27 <sup>8</sup>	58 <sup>5</sup> 0	1 4 <sup>3</sup> 15	8 58 <sup>3</sup> 0	0 <sup>8</sup> 3
Sat.	28	12 18 17 <sup>2</sup> 6	9 <sup>0</sup> 32	1 58 51 <sup>9</sup>	58 <sup>4</sup> 7	1 4 <sup>3</sup> 18	9 18 <sup>2</sup> 8	0 <sup>8</sup> 2
Sun.	29	12 21 54 <sup>0</sup> 2	9 <sup>0</sup> 43	2 22 15 <sup>2</sup>	58 <sup>4</sup> 2	1 4 <sup>3</sup> 21	9 38 <sup>0</sup> 2	0 <sup>8</sup> 1
Mon.	30	12 25 31 <sup>0</sup> 5	9 <sup>0</sup> 55	2 45 37 <sup>3</sup>	58 <sup>3</sup> 5	1 4 <sup>3</sup> 25	9 57 <sup>4</sup> 9	0 <sup>8</sup> 0
Tues.	31	12 29 8 <sup>3</sup> 7		S. 3 8 57 <sup>8</sup>		1 4 <sup>3</sup> 28	10 16 <sup>6</sup> 8	

\* Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup> 18 from the *Sidereal Time*

AT MEAN NOON.

	Day of the Month.	THE SUN'S			Equation of Time, to be added to Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		h m s	° ' "	' "	m s	h m s
n.	1	10 41 4.19	N.8 20 5.2	15 52.7	0 5.98	10 41 10.17
on.	2	10 44 41.97	7 58 14.2	15 53.0	0 24.75	10 45 6.72
ies.	3	10 48 19.49	7 36 15.4	15 53.2	0 43.79	10 49 3.27
ed.	4	10 51 56.75	7 14 9.1	15 53.4	1 3.08	10 52 59.82
ur.	5	10 55 33.77	6 51 55.7	15 53.7	1 22.60	10 56 56.38
id.	6	10 59 10.57	6 29 35.5	15 53.9	1 42.35	11 0 52.93
t.	7	11 2 47.16	6 7 8.8	15 54.2	2 2.32	11 4 49.48
n.	8	11 6 23.56	5 44 36.0	15 54.4	2 22.48	11 8 46.03
on.	9	11 9 59.77	5 21 57.5	15 54.7	2 42.82	11 12 42.59
ies.	10	11 13 35.81	4 59 13.5	15 54.9	3 3.33	11 16 39.14
ed.	11	11 17 11.70	4 36 24.5	15 55.2	3 23.99	11 20 35.69
ur.	12	11 20 47.47	4 13 30.7	15 55.4	3 44.77	11 24 32.24
id.	13	11 24 23.12	3 50 32.5	15 55.7	4 5.67	11 28 28.80
t.	14	11 27 58.67	3 27 30.3	15 56.0	4 26.68	11 32 25.35
n.	15	11 31 34.14	3 4 24.4	15 56.2	4 47.76	11 36 21.90
on.	16	11 35 9.56	2 41 15.2	15 56.5	5 8.89	11 40 18.45
ies.	17	11 38 44.95	2 18 2.9	15 56.7	5 30.06	11 44 15.00
ed.	18	11 42 20.32	1 54 47.8	15 57.0	5 51.24	11 48 11.56
ur.	19	11 45 55.70	1 31 30.4	15 57.3	6 12.40	11 52 8.11
id.	20	11 49 31.12	1 8 10.9	15 57.6	6 33.53	11 56 4.66
t.	21	11 53 6.61	0 44 49.7	15 57.8	6 54.60	12 0 1.21
n.	22	11 56 42.18	N.0 21 27.0	15 58.1	7 15.59	12 3 57.76
on.	23	12 0 17.85	S.0 1 56.8	15 58.4	7 36.47	12 7 54.32
ies.	24	12 3 53.65	0 25 21.4	15 58.6	7 57.22	12 11 50.00
ed.	25	12 7 29.61	0 48 46.4	15 58.9	8 17.81	12 15
ur.	26	12 11 5.76	1 12 11.6	15 59.2	8 38.21	12 19
id.	27	12 14 42.10	1 35 36.6	15 59.4	8 58.42	12 23
t.	28	12 18 18.67	1 59 1.0	15 59.7	9 18.41	12 27
n.	29	12 21 55.48	2 22 24.6	16 0.0	9 38.15	12 31
on.	30	12 25 32.56	2 45 47.0	16 0.2	9 57.62	12 35
ues.	31	12 29 9.92	S.3 9 7.8	16 0.4	10 16.81	12 39

\* The Semidiameter for Apparent Noon may be assumed to be the same as that for Mean Noon.



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Midnight.
1	158° 38' 39" 2	S. 0° 34'	0.0037129	16° 12' 1"	16° 17' 5"	59° 27' 2"	59° 47'
2	159 36 48 5	0 22	0.0036091	16 22 4	16 26 7	60 5 1	60 20
3	160 34 59 8	S. 0 09	0.0035037	16 30 2	16 32 7	60 33 7	60 43
4	161 33 13 0	N. 0 05	0.0033969	16 34 3	16 34 7	60 48 7	60 50
5	162 31 28 1	0 18	0.0032885	16 34 0	16 32 0	60 47 6	60 40
6	163 29 45 1	0 30	0.0031784	16 29 0	16 24 8	60 29 2	60 13
7	164 28 3 8	0 40	0.0030666	16 19 6	16 13 7	59 54 9	59 33
8	165 26 24 3	0 48	0.0029534	16 7 2	16 0 0	59 9 2	58 43
9	166 24 46 4	0 54	0.0028387	15 52 6	15 45 1	58 15 8	57 48
10	167 23 10 3	0 57	0.0027226	15 37 6	15 30 3	57 20 8	56 53
11	168 21 35 7	0 57	0.0026053	15 23 3	15 16 6	56 28 1	56 3
12	169 20 2 9	0 54	0.0024869	15 10 5	15 5 0	55 41 3	55 2
13	170 18 31 6	0 48	0.0023676	15 0 0	14 55 8	55 2 9	54 4
14	171 17 1 8	0 39	0.0022475	14 52 2	14 49 3	54 34 3	54 2
15	172 15 33 7	0 28	0.0021266	14 47 1	14 45 5	54 15 4	54 3
16	173 14 7 2	0 16	0.0020052	14 44 6	14 44 2	54 6 1	54 1
17	174 12 42 4	N. 0 03	0.0018835	14 44 5	14 45 2	54 5 8	54 1
18	175 11 19 3	S. 0 11	0.0017616	14 46 5	14 48 2	54 13 3	54 1
19	176 9 58 0	0 24	0.0016397	14 50 3	14 52 8	54 27 2	54 3
20	177 8 38 6	0 36	0.0015177	14 55 6	14 58 7	54 46 7	54 5
21	178 7 21 1	0 45	0.0013958	15 1 9	15 5 5	55 9 9	55 2
22	179 6 5 6	0 52	0.0012740	15 9 1	15 13 0	55 36 3	55 5
23	180 4 52 1	0 57	0.0011524	15 16 9	15 21 0	56 4 8	56 1
24	181 3 40 7	0 59	0.0010310	15 25 1	15 29 1	56 34 7	56 4
25	182 2 31 5	0 58	0.0009096	15 33 3	15 37 5	57 4 9	57 2
26	183 1 24 7	0 54	0.0007883	15 41 7	15 45 9	57 35 7	57 5
27	184 0 20 0	0 47	0.0006670	15 50 1	15 54 2	58 6 6	58 2
28	184 59 17 6	0 37	0.0005455	15 58 3	16 2 2	58 36 6	58 5
29	185 58 17 6	0 26	0.0004238	16 6 0	16 9 6	59 4 9	59 1
30	186 57 12 9 9	S. 0 13	0.0003018	16 12 8	16 15 7	59 30 1	59 4
31	187 56 12 4 6	0 00	0.0001795	16 18 1	16 19 9	59 49 3	59 5

## MEAN TIME.

		THE MOON'S														
Day of the Week.	Day of the Month.	Longitude.				Latitude.				Age.	Meridian					
		Noon.		Midnight.		Noon.		Midnight.		Noon.	Passage.					
		°	'	"	°	'	"	°	'	"	d	h	m			
Sun.	1	93	23	17.8	100	33	57.6	S. 3	27	44.6	S. 2	56	26.7	24.6	20	22.0
Mon.	2	107	49	7.8	115	8	22.6	2	21	59.8	1	44	54.8	25.6	21	22.7
Tues.	3	122	31	9.6	129	56	47.9	S. 1	5	47.6	S. 0	25	19.8	26.6	22	22.9
Wed.	4	137	24	29.0	144	53	17.5	N. 0	15	43.5	N. 0	56	35.2	27.6	23	21.3
Thur.	5	152	22	13.5	159	50	14.2	1	36	26.9	2	14	32.2	28.6	♂	
Frid.	6	167	16	15.9	174	39	17.2	2	50	7.5	3	22	35.2	0.3	0	17.4
Sat.	7	181	58	20.6	189	12	35.1	3	51	23.2	4	16	6.9	1.3	1	11.1
Sun.	8	196	21	18.4	203	23	57.2	4	36	29.4	4	52	20.8	2.3	2	2.8
Mon.	9	210	20	8.4	217	9	38.9	5	3	38.1	5	10	23.6	3.3	2	53.1
Tues.	10	223	52	25.6	230	28	34.3	5	12	45.1	5	10	53.4	4.3	3	42.7
Wed.	11	236	58	18.6	243	21	58.6	5	5	2.2	4	55	27.2	5.3	4	31.9
Thur.	12	249	40	0.9	255	52	55.8	4	42	24.9	4	26	12.5	6.3	5	21.0
Frid.	13	262	1	17.1	268	5	40.5	4	7	7.4	3	45	26.9	7.3	6	10.0
Sat.	14	274	6	43.2	280	5	3.0	3	21	28.1	2	55	27.8	8.3	6	58.7
Sun.	15	286	1	17.8	291	56	4.6	2	27	43.1	1	58	30.8	9.3	7	47.0
Mon.	16	297	49	59.4	303	43	36.6	1	28	7.6	N. 0	56	50.4	10.3	8	34.5
Tues.	17	309	37	28.4	315	32	5.5	N. 0	24	57.3	S. 0	7	14.0	11.3	9	21.0
Wed.	18	321	27	55.1	327	25	22.2	S. 0	39	25.1	1	11	16.7	12.3	10	6.6
Thur.	19	333	24	49.5	339	26	35.2	1	42	29.4	2	12	42.8	13.3	10	51.3
Frid.	20	345	30	55.6	351	38	3.4	2	41	36.1	3	8	48.8	14.3	11	35.5
Sat.	21	357	48	8.6	4	1	18.1	3	34	0.1	3	56	49.6	15.3	12	19.6
Sun.	22	10	17	36.7	16	37	6.7	4	16	58.0	4	34	6.9	16.3	13	4.3
Mon.	23	22	59	49.2	29	25	43.6	4	47	58.8	4	58	19.2	17.3	13	50.1
Tues.	24	35	54	48.8	42	27	3.5	5	4	54.9	5	7	35.6	18.3	14	37.7
Wed.	25	49	2	26.2	55	40	55.9	5	6	14.0	5	0	45.3	19.3	15	27.7
Thur.	26	62	22	32.2	69	7	15.2	4	51	8.0	4	37	24.8	20.3	16	20.3
Frid.	27	75	55	5.6	82	46	4.3	4	19	40.8	3	58	6.3	21.3	17	15.6
Sat.	28	89	40	12.1	96	37	29.4	3	32	53.9	3	4	21.0	22.3	18	13.1
Sun.	29	103	37	55.0	110	41	25.8	2	32	49.6	1	58	44.7	23.3	19	11.6
Mon.	30	117	47	55.7	124	57	14.7	1	22	35.7	S. 0	44	55.3	24.3	20	10.4
Tues.	31	132	9	7.9	139	23	14.9	S. 0	6	20.1	N. 0	32	31.4	25.3	21	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 1.				TUESDAY 3.			
0	6 14 23.60	N.19 57 8.7	15.07	0	8 18 8.59	N.18 32 38.5	51.9
1	6 16 55.53	19 58 39.1	13.72	1	8 20 43.89	18 27 27.5	53.9
2	6 19 27.65	20 0 1.4	12.38	2	8 23 19.11	18 22 8.4	54.9
3	6 21 59.97	20 1 15.7	11.03	3	8 25 54.26	18 16 41.3	55.9
4	6 24 32.48	20 2 21.9	9.68	4	8 28 29.32	18 11 6.1	57.9
5	6 27 5.18	20 3 20.0	8.32	5	8 31 4.30	18 5 23.0	58.9
6	6 29 38.06	20 4 9.9	6.95	6	8 33 39.19	17 59 32.0	59.9
7	6 32 11.12	20 4 51.6	5.60	7	8 36 13.98	17 53 33.2	61.9
8	6 34 44.34	20 5 25.2	4.20	8	8 38 48.66	17 47 26.5	62.9
9	6 37 17.74	20 5 50.4	2.83	9	8 41 23.24	17 41 12.0	63.9
10	6 39 51.29	20 6 7.4	1.45	10	8 43 57.71	17 34 49.8	64.9
11	6 42 25.00	20 6 16.1	0.07	11	8 46 32.06	17 28 20.0	66.9
12	6 44 58.86	20 6 16.5	1.33	12	8 49 6.29	17 21 42.5	67.9
13	6 47 32.87	20 6 8.5	2.72	13	8 51 40.39	17 14 57.5	68.9
14	6 50 7.01	20 5 52.2	4.13	14	8 54 14.36	17 8 4.9	69.9
15	6 52 41.28	20 5 27.4	5.52	15	8 56 48.20	17 1 5.0	71.9
16	6 55 15.68	20 4 54.3	6.93	16	8 59 21.89	16 53 57.6	72.9
17	6 57 50.21	20 4 12.7	8.35	17	9 1 55.45	16 46 43.0	73.9
18	7 0 24.85	20 3 22.6	9.75	18	9 4 28.85	16 39 21.1	74.9
19	7 2 59.60	20 2 24.1	11.17	19	9 7 2.10	16 31 52.0	76.9
20	7 5 34.46	20 1 17.1	12.58	20	9 9 35.20	16 24 15.8	77.9
21	7 8 9.41	20 0 1.6	13.98	21	9 12 8.13	16 16 32.5	78.9
22	7 10 44.46	19 58 37.7	15.42	22	9 14 40.91	16 8 42.3	79.9
23	7 13 19.59	N.19 57 5.2	16.83	23	9 17 13.51	N.16 0 45.1	80.9
MONDAY 2.				WEDNESDAY 4.			
0	7 15 54.81	N.19 55 24.2	18.25	0	9 19 45.95	N.15 52 41.1	81.9
1	7 18 30.10	19 53 34.7	19.68	1	9 22 18.21	15 44 30.3	82.9
2	7 21 5.46	19 51 36.6	21.08	2	9 24 50.29	15 36 12.9	84.9
3	7 23 40.88	19 49 30.1	22.52	3	9 27 22.19	15 27 48.8	85.9
4	7 26 16.35	19 47 15.0	23.95	4	9 29 53.91	15 19 18.2	86.9
5	7 28 51.88	19 44 51.3	25.35	5	9 32 25.44	15 10 41.1	87.9
6	7 31 27.45	19 42 19.2	26.78	6	9 34 56.78	15 1 57.6	88.9
7	7 34 3.06	19 39 38.5	28.18	7	9 37 27.92	14 53 7.8	89.9
8	7 36 38.70	19 36 49.4	29.62	8	9 39 58.87	14 44 11.8	90.9
9	7 39 14.37	19 33 51.7	31.02	9	9 42 29.63	14 35 9.6	91.9
10	7 41 50.06	19 30 45.6	32.43	10	9 45 0.18	14 26 1.4	92.9
11	7 44 25.76	19 27 31.0	33.85	11	9 47 30.53	14 16 47.1	93.9
12	7 47 1.47	19 24 7.9	35.25	12	9 50 0.67	14 7 27.0	94.9
13	7 49 37.19	19 20 36.4	36.67	13	9 52 30.61	13 58 1.0	95.9
14	7 52 12.98	19 16 56.4	38.05	14	9 55 0.33	13 48 29.3	96.9
15	7 54 48.61	19 13 8.1	39.47	15	9 57 29.85	13 38 51.9	97.9
16	7 57 24.30	19 9 11.3	40.85	16	9 59 59.15	13 29 9.0	98.9
17	7 59 59.97	19 5 6.2	42.23	17	10 2 28.23	13 19 20.6	98.9
18	8 2 35.61	19 0 52.8	43.63	18	10 4 57.10	13 9 26.9	99.9
19	8 5 11.22	18 56 31.0	45.02	19	10 7 25.75	12 59 27.8	100.9
20	8 7 46.80	18 52 0.9	46.38	20	10 9 54.18	12 49 23.5	101.9
21	8 10 22.32	18 47 22.6	47.75	21	10 12 22.39	12 39 14.1	102.9
22	8 12 57.80	18 42 36.1	49.12	22	10 14 50.37	12 28 59.7	103.9
23	8 15 33.23	18 37 41.4	50.48	23	10 17 18.13	12 18 40.4	104.9
24	8 18 8.59	N.18 32 38.5		24	10 19 45.66	N.12 8 16.2	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 5.				SATURDAY 7.			
0	10 19 45.66	N. 12 8 16.2	104.82	0	12 13 22.71	N. 2 45 10.5	124.15
1	10 22 12.97	11 57 47.3	105.60	1	12 15 39.58	2 32 45.6	124.18
2	10 24 40.05	11 47 13.7	106.35	2	12 17 56.27	2 20 20.5	124.20
3	10 27 6.91	11 36 35.6	107.10	3	12 20 12.78	2 7 55.3	124.20
4	10 29 33.53	11 25 53.0	107.82	4	12 22 29.10	1 55 30.1	124.17
5	10 31 59.93	11 15 6.1	108.55	5	12 24 45.25	1 43 5.1	124.15
6	10 34 26.10	11 4 14.8	109.23	6	12 27 1.22	1 30 40.2	124.10
7	10 36 52.04	10 53 19.4	109.92	7	12 29 17.02	1 18 15.6	124.05
8	10 39 17.74	10 42 19.9	110.57	8	12 31 32.65	1 5 51.3	123.97
9	10 41 43.22	10 31 16.5	111.23	9	12 33 48.11	0 53 27.5	123.90
10	10 44 8.47	10 20 9.1	111.87	10	12 36 3.40	0 41 4.1	123.78
11	10 46 33.48	10 8 57.9	112.48	11	12 38 18.52	0 28 41.4	123.68
12	10 48 58.27	9 57 43.0	113.08	12	12 40 33.48	0 16 19.3	123.55
13	10 51 22.82	9 46 24.5	113.67	13	12 42 48.29	N. 0 3 58.0	123.42
14	10 53 47.15	9 35 2.5	114.23	14	12 45 2.94	S. 0 8 22.5	123.27
15	10 56 11.24	9 23 37.1	114.78	15	12 47 17.43	0 20 42.1	123.12
16	10 58 35.10	9 12 8.4	115.33	16	12 49 31.77	0 33 0.8	122.92
17	11 0 58.74	9 0 36.4	115.85	17	12 51 45.95	0 45 18.3	122.75
18	11 3 22.14	8 49 1.3	116.35	18	12 53 59.99	0 57 34.8	122.53
19	11 5 45.32	8 37 23.2	116.83	19	12 56 13.89	1 9 50.0	122.33
20	11 8 8.26	8 25 42.2	117.32	20	12 58 27.63	1 22 4.0	122.10
21	11 10 30.99	8 13 58.3	117.77	21	13 0 41.24	1 34 16.6	121.85
22	11 12 53.48	8 2 11.7	118.20	22	13 2 54.71	1 46 27.7	121.62
23	11 15 15.75	N. 7 50 22.5	118.63	23	13 5 8.03	S. 1 58 37.4	121.35
FRIDAY 6.				SUNDAY 8.			
0	11 17 37.79	N. 7 38 30.7	119.03	0	13 7 21.22	S. 2 10 45.5	121.08
1	11 19 59.61	7 26 36.5	119.43	1	13 9 34.28	2 22 52.0	120.78
2	11 22 21.21	7 14 39.9	119.80	2	13 11 47.21	2 34 56.7	120.50
3	11 24 42.59	7 2 41.1	120.17	3	13 14 0.02	2 46 59.7	120.18
4	11 27 3.74	6 50 40.1	120.52	4	13 16 12.69	2 59 0.8	119.87
5	11 29 24.68	6 38 37.0	120.83	5	13 18 25.25	3 11 0.0	119.53
6	11 31 45.39	6 26 32.0	121.15	6	13 20 37.68	3 22 57.2	119.20
7	11 34 5.89	6 14 25.1	121.45	7	13 22 49.99	3 34 52.4	118.83
8	11 36 26.18	6 2 16.4	121.73	8	13 25 2.19	3 46 45.4	118.48
9	11 38 46.25	5 50 6.0	122.00	9	13 27 14.27	3 58 36.3	118.10
10	11 41 6.11	5 37 54.0	122.23	10	13 29 26.24	4 10 24.9	117.73
11	11 43 25.75	5 25 40.6	122.48	11	13 31 38.10	4 22 11.3	117.32
12	11 45 45.19	5 13 25.7	122.70	12	13 33 49.86	4 33 55.2	116.92
13	11 48 4.42	5 1 9.5	122.90	13	13 36 1.51	4 45 36.7	116.50
14	11 50 23.44	4 48 52.1	123.10	14	13 38 13.05	4 57 13.7	
15	11 52 42.26	4 36 33.5	123.27	15	13 40 24.50	5 8 52.1	
16	11 55 0.88	4 24 13.9	123.42	16	13 42 35.84	5 20 "	
17	11 57 19.30	4 11 53.4	123.57	17	13 44 47.09	5	
18	11 59 37.51	3 59 32.0	123.70	18	13 46 58.24		
19	12 1 55.53	3 47 9.8	123.80	19	13 49 9.30		
20	12 4 13.35	3 34 47.0	123.92	20	13 51 20.27		
21	12 6 30.98	3 22 23.5	123.98	21	13 53 31.16		
22	12 8 48.42	3 9 59.6	124.07	22	13 55 41.93		
23	12 11 5.66	2 57 35.2	124.12	23	13 57 52.4		
24	12 13 22.71	N. 2 45 10.5		24	14 0 3		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 9.				WEDNESDAY 11.			
0	h m s	° ' "	"	0	h m s	° ' "	"
0	14 0 3.29	S. 6 51 15.5	111.28	0	15 43 31.97	S. 14 32 40.4	77.3
1	14 2 13.84	7 2 23.2	110.77	1	15 45 40.61	14 40 27.4	76.9
2	14 4 24.31	7 13 27.8	110.22	2	15 47 49.24	14 48 9.3	76.4
3	14 6 34.71	7 24 29.1	109.67	3	15 49 57.87	14 55 46.2	75.9
4	14 8 45.03	7 35 27.1	109.13	4	15 52 6.48	15 3 18.1	74.4
5	14 10 55.28	7 46 21.9	108.55	5	15 54 15.08	15 10 44.8	73.4
6	14 13 5.46	7 57 13.2	107.98	6	15 56 23.67	15 18 6.3	72.7
7	14 15 15.57	8 8 1.1	107.40	7	15 58 32.25	15 25 23.0	71.9
8	14 17 25.62	8 18 45.5	106.82	8	16 0 40.82	15 32 34.4	71.4
9	14 19 35.60	8 29 26.4	106.22	9	16 2 49.39	15 39 40.6	70.9
10	14 21 45.52	8 40 3.7	105.62	10	16 4 57.94	15 46 41.6	69.7
11	14 23 55.38	8 50 37.4	105.00	11	16 7 6.49	15 53 37.4	68.4
12	14 26 5.19	9 1 7.4	104.38	12	16 9 15.03	16 0 28.0	67.3
13	14 28 14.94	9 11 33.7	103.75	13	16 11 23.56	16 7 13.3	66.4
14	14 30 24.63	9 21 56.2	103.12	14	16 13 32.09	16 13 53.3	65.4
15	14 32 34.27	9 32 14.9	102.48	15	16 15 40.61	16 20 28.1	64.4
16	14 34 43.85	9 42 29.8	101.83	16	16 17 49.13	16 26 57.5	64.1
17	14 36 53.39	9 52 40.8	101.17	17	16 19 57.64	16 33 21.6	63.7
18	14 39 2.87	10 2 47.8	100.52	18	16 22 6.14	16 39 40.3	62.7
19	14 41 12.31	10 12 50.9	99.83	19	16 24 14.64	16 45 53.7	61.9
20	14 43 21.71	10 22 49.9	99.17	20	16 26 23.14	16 52 1.6	60.9
21	14 45 31.06	10 32 44.9	98.47	21	16 28 31.62	16 58 4.2	59.9
22	14 47 40.37	10 42 35.7	97.80	22	16 30 40.10	17 4 1.3	58.7
23	14 49 49.64	S. 10 52 22.5	97.08	23	16 32 48.58	S. 17 9 53.1	57.7
TUESDAY 10.				THURSDAY 12.			
0	h m s	° ' "	"	0	h m s	° ' "	"
0	14 51 58.87	S. 11 2 5.0	96.38	0	16 34 57.06	S. 17 15 39.3	56.7
1	14 54 8.06	11 11 43.3	95.68	1	16 37 5.53	17 21 20.1	55.7
2	14 56 17.22	11 21 17.4	94.97	2	16 39 13.99	17 26 55.4	54.7
3	14 58 26.34	11 30 47.2	94.23	3	16 41 22.44	17 32 25.2	54.1
4	15 0 35.42	11 40 12.6	93.52	4	16 43 30.89	17 37 49.5	53.7
5	15 2 44.48	11 49 33.7	92.78	5	16 45 39.34	17 43 8.2	52.7
6	15 4 53.50	11 58 50.4	92.03	6	16 47 47.77	17 48 21.5	51.7
7	15 7 2.50	12 8 2.6	91.30	7	16 49 56.20	17 53 29.1	50.7
8	15 9 11.46	12 17 10.4	90.55	8	16 52 4.62	17 58 31.2	49.7
9	15 11 20.40	12 26 13.7	89.78	9	16 54 13.03	18 3 27.7	48.7
10	15 13 29.31	12 35 12.4	89.03	10	16 56 21.44	18 8 18.7	47.7
11	15 15 38.20	12 44 6.6	88.25	11	16 58 29.84	18 13 4.0	46.7
12	15 17 47.07	12 52 56.1	87.48	12	17 0 38.22	18 17 43.7	45.7
13	15 19 55.91	13 1 41.0	86.72	13	17 2 46.60	18 22 17.8	44.7
14	15 22 4.73	13 10 21.3	85.92	14	17 4 54.97	18 26 46.2	43.7
15	15 24 13.53	13 18 56.8	85.13	15	17 7 3.33	18 31 9.0	42.7
16	15 26 22.32	13 27 27.6	84.35	16	17 9 11.68	18 35 26.2	41.7
17	15 28 31.08	13 35 53.7	83.55	17	17 11 20.01	18 39 37.7	40.7
18	15 30 39.82	13 44 15.0	82.73	18	17 13 28.34	18 43 43.5	40.7
19	15 32 48.55	13 52 31.4	81.93	19	17 15 36.65	18 47 43.7	39.7
20	15 34 57.26	14 0 43.0	81.12	20	17 17 44.95	18 51 38.1	38.7
21	15 37 5.96	14 8 49.7	80.32	21	17 19 53.24	18 55 26.9	37.7
22	15 39 14.64	14 16 51.6	79.48	22	17 22 1.51	18 59 9.9	36.7
23	15 41 23.31	14 24 48.5	78.65	23	17 24 9.76	19 2 47.3	35.7
24	15 43 31.97	S. 14 32 40.4		24	17 26 18.00	S. 19 6 18.9	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 13.				SUNDAY 15.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	17 26 18.00	S. 19 6 18.9	34.32	0	19 8 16.74	S. 20 3 0.6	11.47
1	17 28 26.22	19 9 44.8	33.37	1	19 10 23.02	20 1 51.8	12.40
2	17 30 34.43	19 13 5.0	32.42	2	19 12 29.24	20 0 37.4	13.33
3	17 32 42.62	19 16 19.5	31.45	3	19 14 35.39	19 59 17.4	14.25
4	17 34 50.78	19 19 28.2	30.50	4	19 16 41.47	19 57 51.9	15.18
5	17 36 58.93	19 22 31.2	29.53	5	19 18 47.48	19 56 20.8	16.10
6	17 39 7.06	19 25 28.4	28.58	6	19 20 53.42	19 54 44.2	17.02
7	17 41 15.16	19 28 19.9	27.62	7	19 22 59.29	19 53 2.1	17.95
8	17 43 23.25	19 31 5.6	26.67	8	19 25 5.08	19 51 14.4	18.85
9	17 45 31.31	19 33 45.6	25.70	9	19 27 10.81	19 49 21.3	19.77
10	17 47 39.34	19 36 19.8	24.73	10	19 29 16.46	19 47 22.7	20.68
11	17 49 47.35	19 38 48.2	23.78	11	19 31 22.03	19 45 18.6	21.60
12	17 51 55.34	19 41 10.9	22.82	12	19 33 27.53	19 43 9.0	22.50
13	17 54 3.30	19 43 27.8	21.85	13	19 35 32.95	19 40 54.0	23.40
14	17 56 11.23	19 45 38.9	20.90	14	19 37 38.30	19 38 33.6	24.32
15	17 58 19.14	19 47 44.3	19.93	15	19 39 43.56	19 36 7.7	25.20
16	18 0 27.01	19 49 43.9	18.97	16	19 41 48.75	19 33 36.5	26.10
17	18 2 34.85	19 51 37.7	18.02	17	19 43 53.85	19 30 59.9	27.00
18	18 4 42.66	19 53 25.8	17.05	18	19 45 58.88	19 28 17.9	27.88
19	18 6 50.43	19 55 8.1	16.08	19	19 48 3.82	19 25 30.6	28.78
20	18 8 58.18	19 56 44.6	15.13	20	19 50 8.68	19 22 37.9	29.65
21	18 11 5.88	19 58 15.4	14.17	21	19 52 13.45	19 19 40.0	30.55
22	18 13 13.55	19 59 40.4	13.20	22	19 54 18.14	19 16 36.7	31.43
23	18 15 21.19	S. 20 0 59.6	12.25	23	19 56 22.75	S. 19 13 28.1	32.30
SATURDAY 14.				MONDAY 16.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	18 17 28.78	S. 20 2 13.1	11.28	0	19 58 27.27	S. 19 10 14.3	33.18
1	18 19 36.34	20 3 20.8	10.33	1	20 0 31.70	19 6 55.2	34.03
2	18 21 43.85	20 4 22.8	9.37	2	20 2 36.05	19 3 31.0	34.92
3	18 23 51.33	20 5 19.0	8.42	3	20 4 40.31	19 0 1.5	35.78
4	18 25 58.76	20 6 9.5	7.45	4	20 6 44.48	18 56 26.8	36.65
5	18 28 6.14	20 6 54.2	6.50	5	20 8 48.56	18 52 46.9	37.50
6	18 30 13.49	20 7 33.2	5.55	6	20 10 52.55	18 49 1.9	38.35
7	18 32 20.78	20 8 6.5	4.58	7	20 12 56.46	18 45 11.8	39.20
8	18 34 28.03	20 8 34.0	3.63	8	20 15 0.27	18 41 16.6	40.07
9	18 36 35.23	20 8 55.8	2.68	9	20 17 3.99	18 37 16.2	40.90
10	18 38 42.39	20 9 11.9	1.73	10	20 19 7.62	18 33 10.8	41.75
11	18 40 49.49	20 9 22.3	0.78	11	20 21 11.16	18 29 0.3	42.58
12	18 42 56.53	20 9 27.0	0.17	12	20 23 14.61	18 24 44.8	43.44
13	18 45 3.53	20 9 26.0	1.13	13	20 25 17.96	18 20 24.3	44
14	18 47 10.48	20 9 19.2	2.07	14	20 27 21.22	18 15 58.8	
15	18 49 17.37	20 9 6.8	3.02	15	20 29 24.38	18 11.1	
16	18 51 24.20	20 8 48.7	3.95	16	20 31 27.46	18	
17	18 53 30.98	20 8 25.0	4.90	17	20 33 30.43	11	
18	18 55 37.70	20 7 55.6	5.85	18	20 35 33.32		
19	18 57 44.36	20 7 20.5	6.80	19	20 37 36.11		
20	18 59 50.96	20 6 39.7	7.72	20	20 39 38.80		
21	19 1 57.50	20 5 53.4	8.67	21	20 41 41.40		
22	19 4 3.98	20 5 1.4	9.60	22	20 43 43.91		
23	19 6 10.40	20 4 3.8	10.53	23	20 45 46.31		
24	19 8 16.74	S. 20 3 0.6		24	20 47 48.6		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10".	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10".
TUESDAY 17.				THURSDAY 19.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	20 47 48.64	S. 17 27 13.9	53.17	0	22 23 53.12	S. 11 51 14.2	85.43
1	20 49 50.86	17 21 54.9	53.93	1	22 25 51.24	11 42 40.4	86.17
2	20 51 52.99	17 16 31.3	54.78	2	22 27 49.30	11 34 3.4	86.71
3	20 53 55.02	17 11 2.9	55.50	3	22 29 47.29	11 25 23.1	87.21
4	20 55 56.96	17 5 29.9	56.28	4	22 31 45.23	11 16 39.5	87.71
5	20 57 58.80	16 59 52.2	57.03	5	22 33 43.10	11 7 52.8	88.21
6	21 0 0.55	16 54 10.0	57.82	6	22 35 40.91	10 59 2.9	88.71
7	21 2 2.20	16 48 23.1	58.57	7	22 37 38.67	10 50 9.9	89.21
8	21 4 3.76	16 42 31.7	59.33	8	22 39 36.37	10 41 13.8	89.71
9	21 6 5.22	16 36 35.7	60.08	9	22 41 34.01	10 32 14.6	90.21
10	21 8 6.59	16 30 35.2	60.83	10	22 43 31.60	10 23 12.4	90.71
11	21 10 7.86	16 24 30.2	61.57	11	22 45 29.14	10 14 7.3	91.21
12	21 12 9.04	16 18 20.8	62.32	12	22 47 26.64	10 4 59.2	91.71
13	21 14 10.12	16 12 6.9	63.03	13	22 49 24.08	9 55 48.2	92.21
14	21 16 11.11	16 5 48.7	63.77	14	22 51 21.48	9 46 34.3	92.71
15	21 18 12.01	15 59 26.1	64.50	15	22 53 18.83	9 37 17.6	93.21
16	21 20 12.82	15 52 59.1	65.22	16	22 55 16.13	9 27 58.1	93.71
17	21 22 13.53	15 46 27.8	65.93	17	22 57 13.39	9 18 35.8	94.1
18	21 24 14.15	15 39 52.2	66.65	18	22 59 10.61	9 9 10.8	94.6
19	21 26 14.68	15 33 12.3	67.35	19	23 1 7.80	8 59 43.1	95.1
20	21 28 15.11	15 26 28.2	68.05	20	23 3 4.94	8 50 12.8	95.6
21	21 30 15.46	15 19 39.9	68.75	21	23 5 2.06	8 40 39.8	96.1
22	21 32 15.72	15 12 47.4	69.43	22	23 6 59.13	8 31 4.3	96.6
23	21 34 15.88	S. 15 5 50.8	70.13	23	23 8 56.18	S. 8 21 26.2	96.7
WEDNESDAY 18.				FRIDAY 20.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	21 36 15.96	S. 14 58 50.0	70.82	0	23 10 53.19	S. 8 11 45.7	97.1
1	21 38 15.95	14 51 45.1	71.48	1	23 12 50.18	8 2 2.7	97.6
2	21 40 15.85	14 44 36.2	72.15	2	23 14 47.14	7 52 17.3	97.9
3	21 42 15.66	14 37 23.3	72.83	3	23 16 44.07	7 42 29.5	98.2
4	21 44 15.39	14 30 6.3	73.48	4	23 18 40.98	7 32 39.4	98.7
5	21 46 15.03	14 22 45.4	74.15	5	23 20 37.87	7 22 46.9	99.1
6	21 48 14.58	14 15 20.5	74.80	6	23 22 34.74	7 12 52.2	99.4
7	21 50 14.06	14 7 51.7	75.43	7	23 24 31.59	7 2 55.3	99.7
8	21 52 13.44	14 0 19.1	76.10	8	23 26 28.43	6 52 56.2	100.2
9	21 54 12.75	13 52 42.5	76.72	9	23 28 25.26	6 42 55.0	100.5
10	21 56 11.97	13 45 2.2	77.35	10	23 30 22.07	6 32 51.6	100.9
11	21 58 11.12	13 37 18.1	77.98	11	23 32 18.87	6 22 46.2	101.2
12	22 0 10.18	13 29 30.2	78.60	12	23 34 15.66	6 12 38.8	101.5
13	22 2 9.17	13 21 38.6	79.22	13	23 36 12.45	6 2 29.4	101.9
14	22 4 8.07	13 13 43.3	79.83	14	23 38 9.24	5 52 18.0	102.2
15	22 6 6.91	13 5 44.3	80.43	15	23 40 6.03	5 42 4.8	102.5
16	22 8 5.66	12 57 41.7	81.03	16	23 42 2.81	5 31 49.7	102.9
17	22 10 4.31	12 49 35.5	81.63	17	23 43 59.60	5 21 32.7	103.1
18	22 12 2.95	12 41 25.7	82.22	18	23 45 56.40	5 11 14.0	103.4
19	22 14 1.49	12 33 12.4	82.78	19	23 47 53.20	5 0 53.6	103.7
20	22 15 59.95	12 24 55.7	83.38	20	23 49 50.01	4 50 31.4	103.9
21	22 17 58.34	12 16 35.4	83.95	21	23 51 46.83	4 40 7.7	104.2
22	22 19 56.67	12 8 11.7	84.52	22	23 53 43.66	4 29 42.3	104.5
23	22 21 54.92	11 59 44.6	85.07	23	23 55 40.51	4 19 15.3	104.7
24	22 23 53.12	S. 11 51 14.2		24	23 57 37.37	S. 4 8 46.8	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 21.				MONDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	23 57 37.37	S. 4 8 46.8	105.00	0	1 32 13.67	N. 4 29 9.3	107.82
1	23 59 34.26	3 58 16.8	105.23	1	1 34 14.31	4 39 56.2	107.68
2	0 1 31.16	3 47 45.4	105.47	2	1 36 15.10	4 50 42.3	107.53
3	0 3 28.10	3 37 12.6	105.70	3	1 38 16.02	5 1 27.5	107.37
4	0 5 25.06	3 26 38.4	105.90	4	1 40 17.09	5 12 11.7	107.20
5	0 7 22.04	3 16 3.0	106.13	5	1 42 18.30	5 22 54.9	107.02
6	0 9 19.06	3 5 26.2	106.32	6	1 44 19.67	5 33 37.0	106.83
7	0 11 16.12	2 54 48.3	106.53	7	1 46 21.19	5 44 18.0	106.63
8	0 13 13.20	2 44 9.1	106.70	8	1 48 22.86	5 54 57.8	106.43
9	0 15 10.33	2 33 28.9	106.90	9	1 50 24.69	6 5 36.4	106.22
10	0 17 7.50	2 22 47.5	107.07	10	1 52 26.67	6 16 13.7	106.00
11	0 19 4.71	2 12 5.1	107.23	11	1 54 28.82	6 26 49.7	105.77
12	0 21 1.96	2 1 21.7	107.38	12	1 56 31.13	6 37 24.3	105.52
13	0 22 59.26	1 50 37.4	107.55	13	1 58 33.61	6 47 57.4	105.28
14	0 24 56.61	1 39 52.1	107.68	14	2 0 36.25	6 58 29.1	105.02
15	0 26 54.02	1 29 6.0	107.82	15	2 2 39.07	7 8 59.2	104.73
16	0 28 51.48	1 18 19.1	107.95	16	2 4 42.06	7 19 27.6	104.48
17	0 30 48.99	1 7 31.4	108.07	17	2 6 45.23	7 29 54.5	104.17
18	0 32 46.57	0 56 43.0	108.18	18	2 8 48.57	7 40 19.5	103.90
19	0 34 44.21	0 45 53.9	108.30	19	2 10 52.10	7 50 42.9	103.57
20	0 36 41.91	0 35 4.1	108.38	20	2 12 55.81	8 1 4.3	103.27
21	0 38 39.68	0 24 13.8	108.47	21	2 14 59.70	8 11 23.9	102.95
22	0 40 37.51	0 13 23.0	108.55	22	2 17 3.78	8 21 41.6	102.60
23	0 42 35.42	S. 0 2 31.7	108.63	23	2 19 8.05	N. 8 31 57.2	102.27
SUNDAY 22.				TUESDAY 24.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	0 44 33.41	N. 0 8 20.1	108.70	0	2 21 12.51	N. 8 42 10.8	101.92
1	0 46 31.47	0 19 12.3	108.75	1	2 23 17.17	8 52 22.3	101.55
2	0 48 29.61	0 30 4.8	108.80	2	2 25 22.02	9 2 31.6	101.18
3	0 50 27.83	0 40 57.6	108.83	3	2 27 27.07	9 12 38.7	100.80
4	0 52 26.13	0 51 50.6	108.83	4	2 29 32.32	9 22 43.5	100.40
5	0 54 24.52	1 2 43.9	108.90	5	2 31 37.78	9 32 45.9	100.02
6	0 56 23.00	1 13 37.3	108.92	6	2 33 43.44	9 42 46.0	99.58
7	0 58 21.57	1 24 30.8	108.93	7	2 35 49.31	9 52 43.5	99.18
8	1 0 20.24	1 35 24.4	108.93	8	2 37 55.39	10 2 38.6	98.75
9	1 2 19.00	1 46 18.0	108.92	9	2 40 1.68	10 12 31.1	98.30
10	1 4 17.86	1 57 11.5	108.92	10	2 42 8.18	10 22 20.9	97.87
11	1 6 16.82	2 8 5.0	108.88	11	2 44 14.90	10 32 8.1	97.40
12	1 8 15.88	2 18 58.3	108.87	12	2 46 21.84	11 52.5	96.83
13	1 10 15.05	2 29 51.5	108.82	13	2 48 29.00	11 34.1	96.25
14	1 12 14.33	2 40 44.4	108.77	14	2 50 36.37	1 12.8	95.67
15	1 14 13.72	2 51 37.0	108.72	15	2 52 43.97	10 48.5	95.09
16	1 16 13.22	3 2 29.3	108.68	16	2 54 51.70	10 21.3	94.51
17	1 18 12.85	3 13 21.2	108.67	17	2 56 59.54	10 51.0	94.00
18	1 20 12.59	3 24 12.6	108.60	18	2 58 67.48	11 17.7	93.50
19	1 22 12.45	3 35 3.6	108.40	19	2 59 55.51	11 41.1	93.00
20	1 24 12.43	3 45 54.0	108.32	20	3 0 43.63	12 1.3	92.50
21	1 26 12.55	3 56 43.9	108.20	21	3 2 31.84	12 18.2	92.00
22	1 28 12.79	4 7 33.1	108.07	22	3 4 20.14	12 31.8	91.70
23	1 30 13.16	4 18 21.5	107.97	23	3 6 8.43	12 42.0	91.12
24	1 32 13.67	N. 4 29 9.3		24	3 8 16.72	12 51.7	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
WEDNESDAY 25.				FRIDAY 27.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	3 12 2.68	N.12 34 48.7	90.53	0	5 0 44.48	N.18 24 26.7	80.51
1	3 14 12.60	12 43 51.9	89.93	1	5 3 6.56	18 29 29.8	49.43
2	3 16 22.77	12 52 51.5	89.32	2	5 5 28.88	18 34 26.4	48.97
3	3 18 33.17	13 1 47.4	88.70	3	5 7 51.44	18 39 16.6	47.78
4	3 20 43.82	13 10 39.6	88.08	4	5 10 14.23	18 44 0.3	46.73
5	3 22 54.72	13 19 28.1	87.43	5	5 12 37.26	18 48 37.4	45.93
6	3 25 5.86	13 28 12.7	86.80	6	5 15 0.52	18 53 7.9	43.57
7	3 27 17.25	13 36 53.5	86.13	7	5 17 24.01	18 57 31.7	42.73
8	3 29 28.89	13 45 30.3	85.45	8	5 19 47.72	19 1 48.7	41.72
9	3 31 40.77	13 54 3.0	84.78	9	5 22 11.66	19 5 59.0	40.58
10	3 33 52.91	14 2 31.7	84.10	10	5 24 35.82	19 10 2.5	39.41
11	3 36 5.30	14 10 56.3	83.40	11	5 27 0.20	19 13 59.2	38.23
12	3 38 17.95	14 19 16.7	82.68	12	5 29 24.80	19 17 48.9	37.13
13	3 40 30.85	14 27 32.8	81.97	13	5 31 49.62	19 21 31.7	35.95
14	3 42 44.00	14 35 44.6	81.25	14	5 34 14.64	19 25 7.4	34.80
15	3 44 57.41	14 43 52.1	80.50	15	5 36 39.88	19 28 36.2	33.60
16	3 47 11.07	14 51 55.1	79.73	16	5 39 5.32	19 31 57.8	32.42
17	3 49 24.99	14 59 53.5	79.00	17	5 41 30.97	19 35 12.3	31.22
18	3 51 39.17	15 7 47.5	78.22	18	5 43 56.82	19 38 19.6	30.01
19	3 53 53.61	15 15 36.8	77.43	19	5 46 22.86	19 41 19.7	28.73
20	3 56 8.30	15 23 21.4	76.65	20	5 48 49.10	19 44 12.6	27.54
21	3 58 23.26	15 31 1.3	75.83	21	5 51 15.53	19 46 58.1	26.97
22	4 0 38.47	15 38 36.3	75.03	22	5 53 42.15	19 49 36.3	25.14
23	4 2 53.94	N.15 46 6.5	74.22	23	5 56 8.95	N.19 52 7.2	23.90
THURSDAY 26.				SATURDAY 28.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	4 5 9.67	N.15 53 31.8	73.38	0	5 58 35.93	N.19 54 30.6	22.67
1	4 7 25.66	16 0 52.1	72.53	1	6 1 3.09	19 56 46.6	21.42
2	4 9 41.91	16 8 7.3	71.68	2	6 3 30.43	19 58 55.1	20.17
3	4 11 58.42	16 15 17.4	70.83	3	6 5 57.93	20 0 56.1	18.90
4	4 14 15.19	16 22 22.4	69.95	4	6 8 25.60	20 2 49.5	17.63
5	4 16 32.22	16 29 22.1	69.07	5	6 10 53.44	20 4 35.4	16.37
6	4 18 49.51	16 36 16.5	68.18	6	6 13 21.43	20 6 13.6	15.10
7	4 21 7.06	16 43 5.6	67.28	7	6 15 49.58	20 7 44.2	13.82
8	4 23 24.87	16 49 49.3	66.38	8	6 18 17.87	20 9 7.1	12.53
9	4 25 42.94	16 56 27.6	65.45	9	6 20 46.32	20 10 22.3	11.23
10	4 28 1.27	17 3 0.3	64.52	10	6 23 14.90	20 11 29.7	9.96
11	4 30 19.85	17 9 27.4	63.58	11	6 25 43.63	20 12 29.4	8.63
12	4 32 38.69	17 15 48.9	62.63	12	6 28 12.48	20 13 21.3	7.38
13	4 34 57.79	17 22 4.7	61.68	13	6 30 41.47	20 14 5.4	6.03
14	4 37 17.14	17 28 14.8	60.72	14	6 33 10.59	20 14 41.6	4.72
15	4 39 36.75	17 34 19.1	59.73	15	6 35 39.82	20 15 9.9	3.43
16	4 41 56.61	17 40 17.5	58.73	16	6 38 9.17	20 15 30.4	2.10
17	4 44 16.72	17 46 9.9	57.75	17	6 40 38.64	20 15 43.0	0.78
18	4 46 37.09	17 51 56.4	56.75	18	6 43 8.22	20 15 47.7	0.55
19	4 48 57.70	17 57 36.9	55.72	19	6 45 37.90	20 15 44.4	1.88
20	4 51 18.56	18 3 11.2	54.72	20	6 48 7.68	20 15 33.1	3.20
21	4 53 39.67	18 8 39.5	53.67	21	6 50 37.55	20 15 13.9	4.52
22	4 56 1.03	18 14 1.5	52.62	22	6 53 7.52	20 14 46.8	5.87
23	4 58 22.63	18 19 17.2	51.58	23	6 55 37.57	20 14 11.6	7.20
24	5 0 44.48	N.18 24 26.7		24	6 58 7.70	N.20 13 28.4	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .
SUNDAY 29.				MONDAY 30.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	6 58 7.70	N.20 13 28.4	8.53	0	7 58 23.31	N.19 16 4.1	40.53
1	7 0 37.91	20 12 37.2	9.87	1	8 0 53.98	19 12 0.9	41.83
2	7 3 8.19	20 11 38.0	11.20	2	8 3 24.62	19 7 49.9	43.13
3	7 5 38.54	20 10 30.8	12.55	3	8 5 55.21	19 3 31.1	44.43
4	7 8 8.96	20 9 15.5	13.88	4	8 8 25.75	18 59 4.5	45.73
5	7 10 39.43	20 7 52.2	15.23	5	8 10 56.25	18 54 30.1	47.02
6	7 13 9.95	20 6 20.8	16.57	6	8 13 26.69	18 49 48.0	48.30
7	7 15 40.53	20 4 41.4	17.92	7	8 15 57.08	18 44 58.2	49.60
8	7 18 11.15	20 2 53.9	19.25	8	8 18 27.40	18 40 0.6	50.85
9	7 20 41.81	20 0 58.4	20.58	9	8 20 57.66	18 34 55.5	52.13
10	7 23 12.50	19 58 54.9	21.93	10	8 23 27.84	18 29 42.7	53.38
11	7 25 43.23	19 56 43.3	23.29	11	8 25 57.95	18 24 22.4	54.65
12	7 28 13.97	19 54 23.6	24.62	12	8 28 27.99	18 18 54.5	55.90
13	7 30 44.74	19 51 55.9	25.95	13	8 30 57.95	18 13 19.1	57.15
14	7 33 15.53	19 49 20.2	27.28	14	8 33 27.81	18 7 36.2	58.38
15	7 35 46.33	19 46 36.5	28.63	15	8 35 57.59	18 1 45.9	59.62
16	7 38 17.13	19 43 44.7	29.95	16	8 38 27.28	17 55 48.2	60.83
17	7 40 47.94	19 40 45.0	31.28	17	8 40 56.87	17 49 43.2	62.05
18	7 43 18.75	19 37 37.3	32.62	18	8 43 26.37	17 43 30.9	63.27
19	7 45 49.55	19 34 21.6	33.95	19	8 45 55.76	17 37 11.3	64.47
20	7 48 20.34	19 30 57.9	35.27	20	8 48 25.04	17 30 44.5	65.67
21	7 50 51.12	19 27 26.3	36.58	21	8 50 54.22	17 24 10.5	66.85
22	7 53 21.88	19 23 46.8	37.90	22	8 53 23.28	17 17 29.4	68.02
23	7 55 52.61	19 19 59.4	39.22	23	8 55 52.23	17 10 41.3	69.20
24	7 58 23.31	N.19 16 4.1		24	8 58 21.06	N.17 3 46.1	

## PHASES OF THE MOON.

● New Moon	- - - - -	d h m	5 17 28.3
☾ First Quarter	- - - - -		12 20 21.1
○ Full Moon	- - - - -		21 0 40.4
☾ Last Quarter	- - - - -		28 9 52.9

☾ Perigee	- - - - -		
☾ Apogee	- - - - -		



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .
		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>
1	Saturn W.	73 0 38	2235	74 48 13	2222	76 36 8	2209	78 24 22
	α Arietis W.	59 7 13	2454	60 49 31	2434	62 32 17	2415	64 15 31
	Aldebaran W.	25 41 16	2248	27 28 32	2235	29 16 7	2222	31 4 2
	Sun E.	65 18 15	2555	63 38 18	2540	61 58 1	2527	60 17 26
2	Saturn W.	87 30 9	2137	89 20 12	2127	91 10 30	2117	93 1 4
	α Arietis W.	72 57 53	2316	74 43 29	2303	76 29 24	2289	78 15 39
	Aldebaran W.	40 8 15	2150	41 57 58	2139	43 47 58	2129	45 38 13
	Sun E.	51 49 59	2453	50 7 39	2441	48 25 3	2431	46 42 13
3	Saturn W.	102 17 28	2064	104 9 23	2057	106 1 28	2050	107 53 44
	α Arietis W.	87 10 54	2230	88 58 37	2222	90 46 31	2216	92 34 35
	Aldebaran W.	54 53 2	2076	56 44 38	2070	58 36 24	2063	60 28 20
	Sun E.	38 4 38	2379	36 20 33	2373	34 36 19	2367	32 51 57
7	Sun W.	17 54 41	2520	19 35 26	2528	21 16 0	2539	22 56 19
	Antares E.	66 10 33	2249	64 23 19	2265	62 36 28	2282	60 50 2
8	Sun W.	31 13 22	2624	32 51 44	2641	34 29 43	2658	36 7 19
	Antares E.	52 4 29	2396	50 20 49	2418	48 37 40	2441	46 55 3
	α Aquilæ E.	99 15 20	2849	97 41 56	2861	96 8 47	2874	94 35 55
9	Sun W.	44 9 15	2769	45 44 24	2788	47 19 7	2808	48 53 25
	Mars W.	19 45 47	2734	21 21 42	2743	22 57 25	2753	24 32 54
	Spica ♀ W.	11 8 14	3345	12 31 33	3148	13 58 44	3020	15 28 32
	Antares E.	38 30 43	2599	36 51 46	2630	35 13 32	2663	33 36 2
	α Aquilæ E.	86 56 46	2978	85 26 6	3000	83 55 53	3021	82 26 6
10	Sun W.	56 38 40	2924	58 10 28	2943	59 41 52	2962	61 12 52
	Mars W.	32 25 54	2840	33 59 30	2856	35 32 45	2873	37 5 38
	Spica ♀ W.	23 15 40	2782	24 50 32	2776	26 25 31	2775	28 0 32
	α Aquilæ E.	75 4 31	3170	73 37 46	3198	72 11 34	3227	70 45 57
	Fomalhaut E.	108 32 42	2870	106 59 44	2883	105 27 3	2896	103 54 39
11	Sun W.	68 42 1	3074	70 10 42	3091	71 39 3	3109	73 7 2
	Mars W.	44 44 45	2974	46 15 31	2989	47 45 57	3005	49 16 3
	Spica ♀ W.	35 54 3	2814	37 28 13	2823	39 2 11	2835	40 35 54
	Venus W.	24 33 28	3278	25 58 5	3282	27 22 38	3285	28 47 7
	α Aquilæ E.	63 46 59	3423	62 25 9	3461	61 4 1	3499	59 43 36
	Fomalhaut E.	96 17 8	2983	94 46 34	2998	93 16 18	3014	91 46 22
12	Sun W.	80 21 57	3206	81 47 59	3221	83 13 43	3235	84 39 11
	Mars W.	56 41 42	3097	58 9 55	3111	59 37 51	3125	61 5 30
	Spica ♀ W.	48 20 55	2902	49 53 12	2913	51 25 14	2924	52 57 3
	Venus W.	35 47 33	3331	37 11 8	3342	38 34 31	3352	39 57 43
	α Aquilæ E.	53 13 11	3772	51 57 40	3825	50 43 4	3883	49 29 27
	Fomalhaut E.	84 21 25	3105	82 53 22	3121	81 25 38	3137	79 58 13
13	Sun W.	91 42 30	3313	93 6 26	3325	94 30 9	3336	95 53 39
	Mars W.	68 19 56	3199	69 46 6	3209	71 12 4	3220	72 37 49
	Spica ♀ W.	60 32 43	2985	62 3 14	2995	63 33 33	3004	65 3 41
	Venus W.	46 50 53	3410	48 12 58	3419	49 34 53	3429	50 56 37
	Fomalhaut E.	72 45 44	3229	71 20 9	3245	69 54 53	3260	68 29 55
	α Pegasi E.	88 3 20	3290	86 38 57	3301	85 14 47	3313	83 50 50



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
1	Saturn W.	80 12 55	2184	82 1 46	2172	83 50 56	2160	85 40 24	2149
	α Arietis W.	65 59 11	2379	67 43 16	2362	69 27 46	2346	71 12 38	2331
	Aldebaran W.	32 52 16	2196	34 40 49	2184	36 29 40	2173	38 18 49	2161
	SUN E.	58 36 32	2501	56 55 20	2488	55 13 50	2476	53 32 3	2464
2	Saturn W.	94 51 53	2097	96 42 57	2088	98 34 15	2080	100 25 45	2072
	α Arietis W.	80 2 11	2266	81 49 0	2256	83 36 4	2247	85 23 22	2237
	Aldebaran W.	47 28 43	2109	49 19 28	2101	51 10 26	2092	53 1 38	2084
	SUN E.	44 59 7	2412	43 15 49	2402	41 32 17	2394	39 48 33	2386
3	Saturn W.	109 46 8	2040	111 38 40	2035	113 31 19	2032	115 24 4	2028
	α Arietis W.	94 22 46	2206	96 11 4	2203	97 59 27	2200	99 47 54	2199
	Aldebaran W.	62 20 25	2032	64 12 39	2048	66 4 59	2044	67 57 25	2040
	SUN E.	31 7 28	2358	29 22 53	2355	27 38 13	2354	25 53 32	2353
7	SUN W.	24 36 23	2564	26 16 8	2578	27 55 33	2593	29 34 38	2608
	Antares E.	59 4 1	2317	57 18 27	2335	55 33 19	2355	53 48 40	2375
8	SUN W.	37 44 32	2695	39 21 19	2712	40 57 43	2731	42 33 41	2750
	Antares E.	45 12 59	2489	43 31 30	2515	41 50 37	2541	40 10 21	2569
	α Aquilæ E.	93 3 23	2905	91 31 10	2922	89 59 19	2940	88 27 51	2958
9	SUN W.	50 27 18	2846	52 0 46	2866	53 33 49	2885	55 6 27	2905
	Mars W.	26 8 8	2779	27 43 3	2793	29 17 40	2808	30 51 57	2824
	Spica η W.	17 0 8	2874	18 33 0	2885	20 6 43	2808	21 41 0	2791
	Antares E.	31 59 21	2737	30 23 30	2779	28 48 35	2825	27 14 40	2876
	α Aquilæ E.	80 56 47	3067	79 27 57	3092	77 59 38	3116	76 31 48	3143
10	SUN W.	62 43 28	3000	64 13 41	3019	65 43 30	3037	67 12 57	3056
	Mars W.	38 38 10	2906	40 10 21	2923	41 42 10	2940	43 13 38	2957
	Spica η W.	29 35 30	2782	31 10 22	2788	32 45 6	2795	34 19 40	2804
	α Aquilæ E.	69 20 55	3288	67 56 29	3320	66 32 41	3352	65 9 30	3387
	Fomalhaut E.	102 22 32	2924	100 50 44	2938	99 19 13	2953	97 48 1	2968
11	SUN W.	74 34 40	3142	76 1 59	3159	77 28 57	3175	78 55 36	3190
	Mars W.	50 45 48	3037	52 15 15	3053	53 44 22	3068	55 13 11	3083
	Spica η W.	42 9 23	2856	43 42 38	2868	45 15 38	2879	46 48 24	2891
	Venus W.	30 11 30	3297	31 35 45	3305	32 59 51	3313	34 23 47	3322
	α Aquilæ E.	58 23 55	3582	57 5 1	3625	55 46 54	3672	54 29 37	3720
	Fomalhaut E.	90 16 45	3043	88 47 26	3060	87 18 27	3075	85 49 47	3090
12	SUN W.	86 4 21	3263	87 29 16	3276	88 53 55	3288	90 18	
	Mars W.	62 32 53	3151	64 0 1	3163	65 26 54	3176	66 53	
	Spica η W.	54 28 37	2946	55 59 58	2956	57 31 6	2966	59	
	Venus W.	41 20 44	3372	42 43 33	3382	44 6 10	3391	45	
	α Aquilæ E.	48 16 52	4009	47 5 21	4079	45 54 59	4134		
	Fomalhaut E.	78 31 6	3168	77 4 18	3183	75 37 48	3198		
13	SUN W.	97 16 57	3356	98 40 4	3365	100 3 0	337		
	Mars W.	74 3 22	3240	75 28 44	3248	76 53 56	325		
	Spica η W.	66 33 38	3021	68 3 25	3029	69 33 2	303		
	Venus W.	52 18 12	3445	53 39 38	3453	55 0 55	346		
	Fomalhaut E.	67 5 15	3292	65 40 54	3308	64 16 52	331		
	α Pegasi E.	82 27 7	3337	81 3 38	3347	79 40 21	335		



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.		Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .
			<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>
14	Sun	W.	102 48 21	3392	104 10 47	3399	105 33 5	3407	106 55 14
	Mars	W.	79 43 49	3273	81 8 32	3280	82 33 7	3288	83 57 33
	Venus	W.	57 43 4	3474	59 3 57	3480	60 24 43	3487	61 45 22
	Antares	W.	27 34 29	3286	28 58 57	3269	30 23 45	3254	31 48 50
	Fomalhaut	E.	61 29 44	3359	60 6 39	3375	58 43 54	3393	57 21 29
	α Pegasi	E.	76 54 28	3383	75 31 52	3394	74 9 29	3406	72 47 19
	Saturn	E.	105 31 43	2996	104 1 25	3002	102 31 14	3009	101 1 12
15	Sun	W.	113 44 20	3439	115 5 53	3444	116 27 20	3446	117 48 45
	Mars	W.	90 58 6	3318	92 21 57	3322	93 45 43	3326	95 9 25
	Venus	W.	68 27 15	3513	69 47 25	3516	71 7 31	3519	72 27 34
	Antares	W.	38 57 15	3203	40 23 21	3197	41 49 34	3193	43 15 52
	Fomalhaut	E.	50 34 50	3515	49 14 42	3539	47 55 1	3565	46 35 48
	α Pegasi	E.	66 0 1	3482	64 39 17	3496	63 18 48	3510	61 58 35
	Saturn	E.	93 32 37	3037	92 3 10	3039	90 33 46	3043	89 4 26
16	Sun	W.	124 35 5	3457	125 56 17	3459	127 17 27	3458	128 38 38
	Mars	W.	102 7 22	3334	103 30 54	3336	104 54 24	3335	106 17 55
	Venus	W.	79 7 22	3525	80 27 18	3526	81 47 13	3525	83 7 9
	Antares	W.	50 28 39	3168	51 55 26	3164	53 22 18	3161	54 49 14
	α Pegasi	E.	55 21 52	3611	54 3 30	3632	52 45 30	3654	51 27 54
	Saturn	E.	81 38 19	3051	80 9 9	3051	78 39 59	3051	77 10 49
17	Venus	W.	89 47 14	3514	91 7 23	3512	92 27 34	3507	93 47 50
	Antares	W.	62 5 9	3135	63 32 36	3131	65 0 8	3126	66 27 46
	α Pegasi	E.	45 6 56	3831	43 52 26	3870	42 38 36	3915	41 25 31
	Saturn	E.	69 44 34	3041	68 15 12	3038	66 45 46	3035	65 16 16
	α Arietis	E.	85 56 25	3216	84 30 35	3214	83 4 42	3212	81 38 47
18	Venus	W.	100 30 12	3482	101 50 56	3478	103 11 45	3472	104 32 40
	Antares	W.	73 47 30	3094	75 15 47	3088	76 44 11	3082	78 12 42
	Saturn	E.	57 47 40	3011	56 17 41	3006	54 47 36	3001	53 17 24
	α Arietis	E.	74 28 30	3198	73 2 19	3195	71 36 4	3193	70 9 47
	Aldebaran	E.	106 5 34	3033	104 36 2	3028	103 6 24	3022	101 36 39
19	Venus	W.	111 18 51	3438	112 40 25	3431	114 2 6	3424	115 23 55
	Antares	W.	85 37 13	3043	87 6 32	3038	88 35 58	3031	90 5 33
	α Aquilæ	W.	44 45 9	4219	45 53 17	4151	47 2 30	4086	48 12 45
	Saturn	E.	45 44 42	2967	44 13 48	2960	42 42 45	2954	41 11 34
	α Arietis	E.	62 57 45	3183	61 31 15	3182	60 4 44	3181	58 38 12
	Aldebaran	E.	94 6 8	2987	92 35 39	2981	91 5 2	2974	89 34 16
20	α Aquilæ	W.	54 17 11	3790	55 32 23	3752	56 48 15	3716	58 4 45
	Saturn	E.	33 33 36	2913	32 1 34	2907	30 29 24	2900	28 57 5
	α Arietis	E.	51 25 46	3190	49 59 25	3194	48 33 9	3199	47 6 59
	Aldebaran	E.	81 58 15	2931	80 26 35	2923	78 54 45	2916	77 22 46
21	α Aquilæ	W.	64 35 43	3538	65 55 24	3515	67 15 32	3492	68 36 5
	Fomalhaut	W.	30 48 16	4012	31 59 44	3908	33 12 56	3815	34 27 43
	α Arietis	E.	39 58 52	3268	38 34 3	3288	37 9 37	3312	35 45 39
	Aldebaran	E.	69 40 21	2869	68 7 22	2860	66 34 12	2852	65 0 51
22	α Aquilæ	W.	75 24 32	3378	76 47 14	3362	78 10 14	3347	79 33 31
	Fomalhaut	W.	41 0 42	3430	42 22 25	3385	43 44 59	3344	45 8 20



MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>h</sup> .	P.L. of diff.	XVIII <sup>h</sup> .	P.L. of diff.	XXI <sup>h</sup> .	P.L. of diff.
14	SUN W.	108 17 17	3419	109 39 12	3425	111 1 0	3430	112 22 43	3435
	Mars W.	85 21 52	3300	86 46 4	3305	88 10 10	3309	89 34 11	3314
	Venus W.	63 5 55	3497	64 26 23	3502	65 46 45	3507	67 7 2	3510
	Antares W.	33 14 10	3231	34 39 42	3223	36 5 24	3215	37 31 16	3209
	Fomalhaut E.	55 59 25	3430	54 37 42	3449	53 16 21	3471	51 55 24	3491
	α Pegasi E.	71 25 24	3431	70 3 42	3443	68 42 14	3455	67 21 0	3469
	Saturn E.	99 31 17	3019	98 1 28	3025	96 31 46	3029	95 2 9	3033
15	SUN W.	119 10 6	3452	120 31 24	3454	121 52 39	3455	123 13 53	3457
	Mars W.	96 33 5	3330	97 56 42	3332	99 20 17	3333	100 43 50	3334
	Venus W.	73 47 34	3523	75 7 33	3525	76 27 30	3525	77 47 27	3526
	Antares W.	44 42 16	3183	46 8 45	3180	47 35 18	3176	49 1 56	3172
	Fomalhaut E.	45 17 5	3622	43 58 54	3654	42 41 18	3690	41 24 20	3727
	α Pegasi E.	60 38 38	3541	59 18 59	3556	57 59 37	3574	56 40 34	3593
	Saturn E.	87 35 9	3047	86 5 54	3048	84 36 41	3050	83 7 30	3050
16	SUN W.	129 59 48	3457	131 21 0	3457	132 42 12	3456	134 3 25	3455
	Mars W.	107 41 27	3333	109 5 0	3332	110 28 34	3331	111 52 10	3329
	Venus W.	84 27 6	3523	85 47 5	3521	87 7 6	3519	88 27 9	3517
	Antares W.	56 16 16	3153	57 43 21	3148	59 10 32	3144	60 37 48	3140
	α Pegasi E.	50 10 43	3704	48 54 0	3731	47 37 46	3762	46 22 4	3794
	Saturn E.	75 41 37	3048	74 12 24	3047	72 43 10	3045	71 13 53	3043
17	Venus W.	95 8 9	3500	96 28 33	3497	97 49 1	3492	99 9 34	3488
	Antares W.	67 55 30	3115	69 23 21	3111	70 51 17	3105	72 19 20	3100
	α Pegasi E.	40 13 16	4018	39 1 54	4079	37 51 32	4146	36 42 15	4222
	Saturn E.	63 46 43	3028	62 17 5	3024	60 47 22	3020	59 17 34	3014
	α Arietis E.	80 12 49	3208	78 46 49	3204	77 20 45	3203	75 54 39	3200
18	Venus W.	105 53 41	3462	107 14 48	3455	108 36 2	3449	109 57 23	3443
	Antares W.	79 41 21	3070	81 10 7	3064	82 39 1	3057	84 8 3	3051
	Saturn E.	51 47 6	2990	50 16 41	2985	48 46 9	2978	47 15 29	2973
	α Arietis E.	68 43 27	3189	67 17 5	3187	65 50 40	3185	64 24 13	3184
	Aldebaran E.	100 6 48	3011	98 36 49	3006	97 6 43	3000	95 36 30	2993
19	Venus W.	116 45 51	3412	118 7 54	3405	119 30 5	3400	120 52 22	3393
	Antares W.	91 35 16	3017	93 5 8	3010	94 35 9	3002	96 5 19	2996
	α Aquilæ W.	49 23 57	3974	50 36 2	3924	51 48 58	3876	53 2 42	3832
	Saturn E.	39 40 15	2941	38 8 48	2935	36 37 13	2927	35 5 28	2921
	α Arietis E.	57 11 40	3182	55 45 9	3183	54 18 39	3184	52 52 11	3187
	Aldebaran E.	88 3 22	2960	86 32 19	2953	85 1 7	2945	83 29 45	2938
20	α Aquilæ W.	59 21 52	3650	60 39 32	3619	61 57 46	3591	63 16 30	3565
	Saturn E.	27 24 38	2887	25 52 2	2880	24 19 17	2874	22 46 25	2868
	α Arietis E.	45 40 58	3215	44 15 6	3225	42 49 26	3237	41 24 0	3252
	Aldebaran E.	75 50 37	2900	74 18 18	2892	72 45 49	2884	71 13 10	2877
21	α Aquilæ W.	69 57 3	3449	71 18 24	3430	72 40 6	3412	74 2 9	3394
	Fomalhaut W.	35 43 55	3660	37 1 25	3593	38 20 7	3534	39 39 54	3479
	α Arietis E.	34 22 13	3373	32 59 26	3411	31 37 22	3458	30 16 11	3513
	Aldebaran E.	63 27 21	2835	61 53 39	2828	60 19 47	2819	58 45 44	2811
22	α Aquilæ W.	80 57 3	3320	82 20 51	3307	83 44 54	3296	85 9 10	3286
	Fomalhaut W.	46 32 26	3270	47 57 13	3237	49 22 39	3205	50 48 42	3177



MEAN TIME.											
LUNAR DISTANCES.											
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .			
		° ' "		° ' "		° ' "		° ' "	° ' "		
22	α Pegasi W.	30 6 26	4603	31 8 48	4435	32 13 38	4237	33 20 43			
	Aldebaran E.	57 11 31	2802	55 37 6	2795	54 2 31	2787	52 27 46			
23	α Aquilæ W.	86 33 38	3276	87 58 18	3265	89 23 10	3257	90 48 12			
	Fomalhaut W.	52 15 18	3150	53 42 27	3126	55 10 5	3101	56 38 13			
	α Pegasi W.	39 23 40	3684	40 40 44	3615	41 59 2	3553	43 18 28			
	Aldebaran E.	44 31 12	2736	42 55 20	2729	41 19 18	2720	39 43 4			
	Pollux E.	88 43 45	2785	87 8 58	2776	85 33 59	2769	83 58 50			
24	α Aquilæ W.	97 55 22	3220	99 21 7	3218	100 46 55	3215	102 12 46			
	Fomalhaut W.	64 5 16	2983	65 35 50	2967	67 6 44	2950	68 37 59			
	α Pegasi W.	50 9 55	3274	51 34 37	3238	53 0 1	3205	54 26 4			
	Saturn W.	17 12 7	2669	18 49 29	2656	20 27 8	2644	22 5 3			
	Aldebaran E.	31 39 7	2669	30 1 46	2661	28 24 14	2652	26 46 30			
	Pollux E.	76 0 23	2720	74 24 10	2713	72 47 47	2705	71 11 14			
25	Fomalhaut W.	76 18 46	2868	77 51 46	2856	79 25 2	2844	80 58 33			
	α Pegasi W.	61 44 50	3047	63 14 5	3025	64 43 47	3005	66 13 54			
	Saturn W.	30 18 9	2583	31 57 27	2574	33 36 57	2564	35 16 41			
	α Arietis W.	20 10 12	4276	21 17 27	4032	22 28 35	3833	23 43 3			
	Pollux E.	63 6 0	2662	61 28 29	2655	59 50 49	2648	58 12 59			
	Regulus E.	98 42 43	2599	97 3 47	2591	95 24 39	2582	93 45 19			
	SUN E.	132 47 24	2951	131 16 10	2941	129 44 43	2931	128 13 4			
26	α Pegasi W.	73 50 14	2901	75 22 32	2886	76 55 9	2872	78 28 4			
	Saturn W.	43 38 33	2509	45 19 34	2500	47 0 48	2490	48 42 16			
	α Arietis W.	30 31 50	3153	31 58 55	3088	33 27 19	3031	34 56 54			
	Pollux E.	50 1 49	2614	48 23 13	2610	46 44 32	2605	45 5 44			
	Regulus E.	85 25 35	2529	83 45 2	2519	82 4 15	2510	80 23 16			
	SUN E.	120 31 35	2871	118 58 39	2861	117 25 30	2851	115 52 8			
27	α Pegasi W.	86 16 43	2800	87 51 11	2790	89 25 52	2780	91 0 46			
	Saturn W.	57 12 50	2434	58 55 36	2424	60 38 36	2415	62 21 49			
	α Arietis W.	42 38 57	2789	44 13 40	2760	45 49 1	2732	47 24 58			
	Pollux E.	36 51 1	2600	35 12 5	2602	33 33 13	2609	31 54 30			
	Regulus E.	71 55 8	2455	70 12 51	2446	68 30 22	2436	66 47 39			
	SUN E.	108 2 2	2791	106 27 22	2780	104 52 28	2771	103 17 22			
28	Saturn W.	71 1 15	2359	72 45 49	2350	74 30 36	2340	76 15 37			
	α Arietis W.	55 32 28	2602	57 11 20	2584	58 50 37	2567	60 30 17			
	Aldebaran W.	21 58 58	2382	23 42 58	2373	25 27 11	2364	27 11 38			
	Regulus E.	58 10 46	2381	56 26 44	2371	54 42 28	2362	52 57 59			
	SUN E.	95 18 29	2710	93 42 2	2701	92 5 23	2690	90 28 30			
29	Saturn W.	85 4 0	2286	86 50 20	2277	88 36 53	2269	90 23 38			
	α Arietis W.	68 53 53	2480	70 35 34	2467	72 17 33	2456	73 59 48			
	Aldebaran W.	35 57 16	2309	37 43 3	2299	39 29 4	2291	41 15 17			
	Regulus E.	44 12 15	2309	42 26 28	2299	40 40 27	2291	38 54 14			
	SUN E.	82 20 50	2633	80 42 40	2624	79 4 17	2615	77 25 42			
30	Saturn W.	99 20 31	2220	101 8 29	2213	102 56 38	2206	104 44 57			
	α Arietis W.	82 34 57	2395	84 18 39	2385	86 2 35	2378	87 46 41			
	Aldebaran W.	50 9 28	2241	51 56 54	2234	53 44 31	2227	55 32 19			
	Regulus E.	30 0 7	2243	28 12 43	2235	26 25 8	2229	24 37 23			
	SUN E.	69 9 47	2564	67 30 2	2556	65 50 7	2549	64 10 2			



MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
22	$\alpha$ Pegasi W.	34 29 51	4039	35 40 52	3935	36 53 36	3843	38 7 54	3758
	Aldebaran E.	50 52 49	2769	49 17 41	2761	47 42 22	2753	46 6 53	2744
23	$\alpha$ Aquilæ W.	92 13 23	3242	93 38 42	3236	95 4 9	3230	96 29 43	3225
	Fomalhaut W.	58 6 48	3058	59 35 49	3038	61 5 15	3019	62 35 4	3001
	$\alpha$ Pegasi W.	44 38 57	3444	46 0 24	3396	47 22 45	3352	48 45 56	3311
	Aldebaran E.	38 6 39	2703	36 30 3	2694	34 53 15	2686	33 16 17	2678
	Pollux E.	82 23 29	2753	80 47 59	2744	79 12 17	2736	77 36 25	2729
24	$\alpha$ Aquilæ W.	103 38 39	3213	105 4 33	3214	106 30 26	3215	107 56 17	3218
	Fomalhaut W.	70 9 32	2920	71 41 25	2907	73 13 35	2894	74 46 2	2880
	$\alpha$ Pegasi W.	55 52 44	3146	57 19 58	3119	58 47 45	3093	60 16 3	3069
	Saturn W.	23 43 12	2623	25 21 36	2613	27 0 13	2602	28 39 5	2593
	Aldebaran E.	25 8 36	2636	23 30 30	2627	21 52 12	2620	20 13 44	2611
	Pollux E.	69 34 31	2690	67 57 38	2683	66 20 35	2676	64 43 23	2668
25	Fomalhaut W.	82 32 18	2822	84 6 17	2811	85 40 30	2802	87 14 56	2792
	$\alpha$ Pegasi W.	67 44 26	2967	69 15 20	2949	70 46 37	2931	72 18 16	2916
	Saturn W.	36 56 38	2546	38 36 47	2537	40 17 9	2527	41 57 45	2518
	$\alpha$ Arietis W.	25 0 25	3530	26 20 16	3413	27 42 18	3313	29 6 14	3228
	Pollux E.	56 35 1	2636	54 56 55	2630	53 18 41	2624	51 40 19	2618
	Regulus E.	92 5 47	2564	90 26 2	2556	88 46 6	2546	87 5 57	2537
	SUN E.	126 41 11	2911	125 9 6	2902	123 36 49	2891	122 4 18	2881
26	$\alpha$ Pegasi W.	80 1 16	2845	81 34 45	2834	83 8 29	2821	84 42 29	2811
	Saturn W.	50 23 56	2471	52 5 50	2462	53 47 57	2453	55 30 17	2443
	$\alpha$ Arietis W.	36 27 32	2933	37 59 9	2892	39 31 38	2855	41 4 55	2820
	Pollux E.	43 26 52	2600	41 47 57	2598	40 8 59	2596	38 29 59	2598
	Regulus E.	78 42 4	2492	77 0 39	2483	75 19 2	2473	73 37 11	2465
	SUN E.	114 18 33	2831	112 44 45	2821	111 10 44	2811	109 36 30	2800
27	$\alpha$ Pegasi W.	92 35 51	2763	94 11 7	2756	95 46 33	2748	97 22 9	2741
	Saturn W.	64 5 15	2396	65 48 55	2387	67 32 48	2378	69 16 55	2369
	$\alpha$ Arietis W.	49 1 28	2684	50 38 30	2661	52 16 2	2641	53 54 1	2621
	Pollux E.	30 15 57	2627	28 37 39	2643	26 59 42	2663	25 22 13	2690
	Regulus E.	65 4 43	2418	63 21 34	2408	61 38 11	2399	59 54 35	2380
	SUN E.	101 42 2	2750	100 6 28	2741	98 30 42	2730	96 54 3	2720
28	Saturn W.	78 0 51	2322	79 46 18	2313	81 31 59	2304	83 17	2295
	$\alpha$ Arietis W.	62 10 19	2536	63 50 42	2521	65 31 26	2507	67 12	2493
	Aldebaran W.	28 56 19	2345	30 41 13	2335	32 26 21	2326	34 11	2317
	Regulus E.	51 13 16	2344	49 28 21	2335	47 43 12	2326	45 58	2317
	SUN E.	88 51 24	2671	87 14 5	2661	85 36 3	2652	83 52	2643
29	Saturn W.	92 10 36	2252	93 57 47	2243	95 45 10	2234	97 32	2225
	$\alpha$ Arietis W.	75 42 20	2433	77 25 8	2422	79 8 1	2413	80 53	2404
	Aldebaran W.	43 1 43	2274	44 48 21	2266	46 35 1	2257	48 5	2248
	Regulus E.	37 7 49	2274	35 21 11	2266	33 34 0	2257	31 1	2248
	SUN E.	75 46 54	2596	74 7 54	2588	72 28 4	2579	70 0	2570
30	Saturn W.	106 33 28	2192	108 22 8	2184	110 10 0	2175	111 5	2166
	$\alpha$ Arietis W.	89 30 59	2364	91 15 26	2357	93 0 0	2348	94 5	2339
	Aldebaran W.	57 20 18	2213	59 8 26	2206	60 56 0	2197	62 5	2188
	Regulus E.	22 49 27	2215	21 1 22	2209	19 17 0	2200	17 1	2191
	SUN E.	62 29 46	2535	60 49 22	2528	59 0 0	2519	57 0	2510



---

**CONFIGURATIONS OF THE SATELLITES OF JUPITER**

---

**THE SATELLITES OF JUPITER**

are not visible this Month,

JUPITER being too near to the SUN.

## ECLIPSES OF THE SATELLITES OF JUPITER.

THE ECLIPSES OF THE SATELLITES OF JUPITER

are not visible this Month,

JUPITER being too near to the SUN.



APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

---

THE SATELLITES of JUPITER

are not visible this Month,

JUPITER being too near to the SUN.

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>d</sup> .629573, Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	+1.2431	-0.8619	+9.6324	+0.7729	<sup>h</sup> 13 <sup>m</sup> 16 <sup>s</sup> 38.97	162	243	.665
2	1.2459	0.8421	9.6343	0.7716	13 12 43.06	163	244	.668
3	1.2485	0.8212	9.6362	0.7703	13 8 47.15	164	245	.671
4	+1.2509	-0.7992	+9.6380	+0.7690	13 4 51.25	165	246	.674
5	1.2532	0.7758	9.6399	0.7677	13 0 55.34	166	247	.676
6	1.2554	0.7509	9.6417	0.7665	12 56 59.43	167	248	.679
7	+1.2575	-0.7244	+9.6434	+0.7653	12 53 3.53	168	249	.682
8	1.2594	0.6960	9.6452	0.7642	12 49 7.62	169	250	.684
9	1.2612	0.6655	9.6469	0.7630	12 45 11.71	170	251	.687
10	+1.2628	-0.6325	+9.6486	+0.7620	12 41 15.81	171	252	.690
11	1.2643	0.5966	9.6503	0.7609	12 37 19.90	172	253	.693
12	1.2657	0.5574	9.6520	0.7599	12 33 23.99	173	254	.695
13	+1.2670	-0.5141	+9.6537	+0.7590	12 29 28.09	174	255	.698
14	1.2681	0.4658	9.6553	0.7581	12 25 32.18	175	256	.701
15	1.2691	0.4113	9.6570	0.7572	12 21 36.28	176	257	.704
16	+1.2700	-0.3488	+9.6586	+0.7564	12 17 40.37	177	258	.706
17	1.2707	0.2756	9.6602	0.7556	12 13 44.46	178	259	.709
18	1.2714	0.1873	9.6618	0.7549	12 9 48.56	179	260	.712
19	+1.2719	-0.0761	+9.6634	+0.7542	12 5 52.65	180	261	.715
20	1.2722	9.9260	9.6650	0.7536	12 1 56.74	181	262	.717
21	1.2725	9.6943	9.6665	0.7530	11 58 0.84	182	263	.720
22	+1.2726	-9.1634	+9.6681	+0.7524	11 54 4.93	183	264	.723
23	1.2726	+9.3087	9.6697	0.7519	11 50 9.03	184	265	.726
24	1.2724	9.7427	9.6712	0.7515	11 46 13.12	185	266	.728
25	+1.2722	+9.9554	+9.6727	+0.7511	11 42 17.21	186	267	.73
26	1.2718	0.0975	9.6743	0.7507	11 38 21.31	187	268	.7
27	1.2713	0.2044	9.6758	0.7504	11 34 25.40	188	269	.7
28	+1.2706	+0.2901	+9.6774	+0.7502	11 30 29.49	189	270	.7
29	1.2698	0.3615	9.6789	0.7500	11 26 33.59	1	71	
30	1.2689	0.4228	9.6805	0.7498	11 22 37.68			
31	+1.2679	+0.4764	+9.6820	+0.7497	11 18 41.71			



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be subtracted from Apparent Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>
Tues.	1	12 29 8.37	9.067	S. 3 8 57.8	58.27	1 4.28	10 16.68
Wed.	2	12 32 45.98	9.080	3 32 16.4	58.18	1 4.33	10 35.57
Thur.	3	12 36 23.91	9.095	3 55 32.7	58.07	1 4.38	10 54.14
Frid.	4	12 40 2.19	9.110	4 18 46.4	57.94	1 4.43	11 12.36
Sat.	5	12 43 40.82	9.125	4 41 57.0	57.80	1 4.48	11 30.23
Sun.	6	12 47 19.82	9.141	5 5 4.2	57.64	1 4.54	11 47.74
Mon.	7	12 50 59.20	9.158	5 28 7.5	57.47	1 4.60	12 4.86
Tues.	8	12 54 38.99	9.175	5 51 6.7	57.28	1 4.67	12 21.58
Wed.	9	12 58 19.20	9.193	6 14 1.3	57.07	1 4.73	12 37.88
Thur.	10	13 1 59.84	9.212	6 36 50.9	56.85	1 4.80	12 53.74
Frid.	11	13 5 40.94	9.232	6 59 35.2	56.61	1 4.87	13 9.16
Sat.	12	13 9 22.51	9.252	7 22 13.7	56.35	1 4.94	13 24.10
Sun.	13	13 13 4.56	9.273	7 44 46.1	56.08	1 5.01	13 38.56
Mon.	14	13 16 47.11	9.295	8 7 11.9	55.79	1 5.09	13 52.52
Tues.	15	13 20 30.19	9.318	8 29 30.9	55.48	1 5.17	14 5.95
Wed.	16	13 24 13.82	9.341	8 51 42.5	55.17	1 5.26	14 18.85
Thur.	17	13 27 58.01	9.365	9 13 46.5	54.83	1 5.35	14 31.18
Frid.	18	13 31 42.78	9.390	9 35 42.5	54.48	1 5.44	14 42.93
Sat.	19	13 35 28.15	9.416	9 57 30.0	54.11	1 5.53	14 54.09
Sun.	20	13 39 14.14	9.443	10 19 8.7	53.73	1 5.62	15 4.62
Mon.	21	13 43 0.78	9.471	10 40 38.3	53.34	1 5.71	15 14.50
Tues.	22	13 46 48.08	9.500	11 1 58.4	52.93	1 5.81	15 23.73
Wed.	23	13 50 36.07	9.528	11 23 8.6	52.50	1 5.91	15 32.27
Thur.	24	13 54 24.75	9.558	11 44 8.5	52.05	1 6.01	15 40.12
Frid.	25	13 58 14.15	9.589	12 4 57.7	51.59	1 6.11	15 47.25
Sat.	26	14 2 4.29	9.620	12 25 35.9	51.12	1 6.22	15 53.65
Sun.	27	14 5 55.18	9.652	12 46 2.7	50.62	1 6.32	15 59.29
Mon.	28	14 9 46.84	9.685	13 6 17.6	50.11	1 6.43	16 4.18
Tues.	29	14 13 39.27	9.718	13 26 20.3	49.59	1 6.54	16 8.30
Wed.	30	14 17 32.49	9.751	13 46 10.4	49.05	1 6.65	16 11.62
Thur.	31	14 21 26.51	9.784	14 5 47.5	48.48	1 6.76	16 14.15
Frid.	32	14 25 21.33		S. 14 25 11.1		1 6.87	16 15.87

\* Mean Time of the Semidiameter passing may be found by subtracting 0<sup>m</sup> 18 from the Sidereal

## AT MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S			Equation of Time, to be added to Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
Tues.	1	12 29 9.92	S. 3 9 7.8	16 0.5	10 16.81	12 39 26.73
Wed.	2	12 32 47.58	3 32 26.7	16 0.8	10 35.70	12 43 23.28
Thur.	3	12 36 25.56	3 55 43.3	16 1.1	10 54.27	12 47 19.84
Frid.	4	12 40 3.89	4 18 57.2	16 1.3	11 12.50	12 51 16.39
Sat.	5	12 43 42.57	4 42 8.1	16 1.6	11 30.37	12 55 12.94
Sun.	6	12 47 21.61	5 5 15.5	16 1.9	11 47.88	12 59 9.49
Mon.	7	12 51 1.04	5 28 19.1	16 2.2	12 5.00	13 3 6.05
Tues.	8	12 54 40.88	5 51 18.5	16 2.4	12 21.72	13 7 2.60
Wed.	9	12 58 21.13	6 14 13.3	16 2.7	12 38.02	13 10 59.15
Thur.	10	13 2 1.82	6 37 3.1	16 3.0	12 53.88	13 14 55.70
Frid.	11	13 5 42.96	6 59 47.6	16 3.3	13 9.29	13 18 52.26
Sat.	12	13 9 24.57	7 22 26.3	16 3.6	13 24.23	13 22 48.81
Sun.	13	13 13 6.66	7 44 58.8	16 3.8	13 38.69	13 26 45.36
Mon.	14	13 16 49.26	8 7 24.8	16 4.1	13 52.65	13 30 41.91
Tues.	15	13 20 32.39	8 29 43.9	16 4.4	14 6.08	13 34 38.47
Wed.	16	13 24 16.05	8 51 55.7	16 4.7	14 18.97	13 38 35.02
Thur.	17	13 28 0.27	9 13 59.8	16 5.0	14 31.30	13 42 31.57
Frid.	18	13 31 45.08	9 35 55.8	16 5.2	14 43.05	13 46 28.13
Sat.	19	13 35 30.48	9 57 43.4	16 5.5	14 54.20	13 50 24.68
Sun.	20	13 39 16.51	10 19 22.2	16 5.8	15 4.72	13 54 21.23
Mon.	21	13 43 3.19	10 40 51.9	16 6.0	15 14.60	13 58 17.79
Tues.	22	13 46 50.52	11 2 12.0	16 6.3	15 23.82	14 2 .
Wed.	23	13 50 38.54	11 23 22.2	16 6.6	15 32.35	14 6
Thur.	24	13 54 27.25	11 44 22.1	16 6.8	15 40.19	14
Frid.	25	13 58 16.68	12 5 11.3	16 7.1	15 47.32	
Sat.	26	14 2 6.84	12 25 49.5	16 7.3	15 53.71	
Sun.	27	14 5 57.76	12 46 16.2	16 7.6	15 59.35	
Mon.	28	14 9 49.43	13 6 31.1	16 7.8	16 4	
Tues.	29	14 13 41.88	13 26 33.7	16 8.1	16 P	
Wed.	30	14 17 35.12	13 46 23.7	16 8.3	16	
Thur.	31	14 21 29.15	14 6 0.6	16 8.6	16	
Frid.	32	14 25 23.99	S. 14 25 24.1	16 8.8	16	

\* The Semidiameter for *Apparent* Noon may be assumed the same :



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Midnight.
1	187° 56' 24" 6	0° 00'	0.0001795	16' 18" 1	16' 19" 9	59' 49" 3	59' 53"
2	188 55 31 4	N. 0° 14'	0.0000568	16 21 0	16 21 4	60 0 0	60 1
3	189 54 40 5	0° 26'	9.9999336	16 20 9	16 19 6	59 59 6	59 54
4	190 53 51 9	0° 37'	9.9998097	16 17 4	16 14 4	59 46 9	59 33
5	191 53 5 5	0° 46'	9.9996853	16 10 5	16 5 9	59 21 5	59 4
6	192 52 21 0	0° 52'	9.9995602	16 0 6	15 54 8	58 45 2	58 24
7	193 51 38 6	0° 55'	9.9994347	15 48 7	15 42 2	58 1 3	57 37
8	194 50 58 1	0° 56'	9.9993086	15 35 7	15 29 1	57 13 6	56 49
9	195 50 19 6	0° 54'	9.9991821	15 22 7	15 16 5	56 25 9	56 3
10	196 49 43 0	0° 49'	9.9990554	15 10 7	15 5 4	55 42 1	55 29
11	197 49 8 1	0° 41'	9.9989286	15 0 6	14 56 4	55 5 0	54 49
12	198 48 35 1	0° 30'	9.9988017	14 52 9	14 50 1	54 36 9	54 26
13	199 48 3 7	0° 18'	9.9986751	14 48 0	14 46 6	54 18 8	54 13
14	200 47 34 1	N. 0° 05'	9.9985488	14 46 0	14 45 9	54 11 3	54 11
15	201 47 6 3	S. 0° 09'	9.9984228	14 46 6	14 47 9	54 13 7	54 18
16	202 46 40 2	0° 22'	9.9982975	14 49 9	14 52 4	54 25 6	54 34
17	203 46 15 9	0° 33'	9.9981731	14 55 4	14 58 8	54 45 9	54 58
18	204 45 53 4	0° 43'	9.9980496	15 2 6	15 6 7	55 12 3	55 27
19	205 45 32 7	0° 51'	9.9979271	15 11 1	15 15 6	55 43 4	56 0
20	206 45 14 0	0° 57'	9.9978057	15 20 2	15 24 8	56 16 9	56 32
21	207 44 57 3	0° 59'	9.9976856	15 29 4	15 33 9	56 50 8	57 7
22	208 44 42 5	0° 59'	9.9975668	15 38 2	15 42 4	57 23 1	57 38
23	209 44 29 9	0° 55'	9.9974491	15 46 2	15 49 8	57 52 4	58 5
24	210 44 19 3	0° 49'	9.9973327	15 53 1	15 56 0	58 17 5	58 28
25	211 44 10 8	0° 40'	9.9972174	15 58 6	16 0 9	58 37 9	58 46
26	212 44 4 6	0° 29'	9.9971032	16 3 0	16 4 7	58 53 8	59 0
27	213 44 0 6	0° 16'	9.9969900	16 6 1	16 7 2	59 5 3	59 9
28	214 43 58 8	S. 0° 03'	9.9968778	16 8 0	16 8 6	59 12 4	59 14
29	215 43 59 1	N. 0° 11'	9.9967664	16 8 8	16 8 8	59 15 3	59 15
30	216 44 1 7	0° 23'	9.9966558	16 8 3	16 7 4	59 13 4	59 10
31	217 44 6 4	0° 34'	9.9965459	16 6 1	16 4 3	59 5 3	58 58
32	218 44 13 2	N. 0° 44'	9.9964367	16 2 1	15 59 3	58 50 5	58 40

## MEAN TIME.

Day of the Week.	Day of the Month.	THE MOON'S					
		Longitude.		Latitude.		Age.	Meridian
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.
		<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>a</sup> <sup>h</sup> <sup>m</sup>	
Tues.	1	132 9 7.9	139 23 14.9	S. 0 6 20.1	N. 0 32 31.4	25.3	21 7.3
Wed.	2	146 39 8.9	153 56 17.2	N. 1 10 58.2	1 48 19.5	26.3	22 2.8
Thur.	3	161 14 0.6	168 31 35.3	2 23 54.4	2 57 4.1	27.3	22 56.6
Frid.	4	175 48 12.7	183 3 2.4	3 27 13.5	3 53 52.0	28.3	23 48.8
Sat.	5	190 15 13.9	197 23 58.3	4 16 34.2	4 35 1.8	29.3	♄
Sun.	6	204 28 30.4	211 28 11.2	4 49 3.3	4 58 33.0	0.9	0 40.0
Mon.	7	218 22 28.6	225 10 59.2	5 3 31.3	5 4 5.4	1.9	1 30.5
Tues.	8	231 53 28.1	238 29 49.6	5 0 25.4	4 52 45.9	2.9	2 20.9
Wed.	9	245 0 6.4	251 24 29.4	4 41 23.4	4 26 37.0	3.9	3 11.2
Thur.	10	257 43 17.0	263 56 53.4	4 8 46.1	3 48 10.1	4.9	4 1.4
Frid.	11	270 5 48.1	276 10 34.9	3 25 9.1	3 0 2.3	5.9	4 51.2
Sat.	12	282 11 50.8	288 10 14.9	2 33 8.2	2 4 45.2	6.9	5 40.4
Sun.	13	294 6 27.8	300 1 11.0	1 35 11.0	1 4 42.9	7.9	6 28.5
Mon.	14	305 55 5.6	311 48 52.6	N. 0 33 37.5	N. 0 2 12.3	8.9	7 15.5
Tues.	15	317 43 11.4	323 38 40.0	S. 0 29 15.7	S. 1 0 29.2	9.9	8 1.4
Wed.	16	329 35 54.0	335 35 26.5	1 31 10.3	2 1 0.2	10.9	8 46.3
Thur.	17	341 37 46.9	347 43 21.1	2 29 40.4	2 56 50.5	11.9	9 30.5
Frid.	18	353 52 30.6	0 5 32.3	3 22 10.8	3 45 20.7	12.9	10 14.7
Sat.	19	6 22 38.0	12 43 54.5	4 6 0.1	4 23 48.9	13.9	10 59.5
Sun.	20	19 9 23.0	25 39 0.1	4 38 27.6	4 49 39.4	14.9	11 45.4
Mon.	21	32 12 37.8	38 50 3.7	4 57 8.5	5 0 42.3	15.9	12 33.1
Tues.	22	45 31 2.4	52 15 15.7	5 0 11.2	4 55 29.6	16.9	13 23.2
Wed.	23	59 2 24.4	65 52 8.6	4 46 35.9	4 33 32.8	17.9	14 16.0
Thur.	24	72 44 8.8	79 38 7.0	4 16 28.1	3 55 32.8	18.9	15 11.3
Frid.	25	86 33 47.2	93 30 55.2	3 31 3.2	3 3 19.2	19.9	16 5.3
Sat.	26	100 29 20.0	107 28 52.7	2 32 44.2	1 59 45.2	20.9	17 1.8
Sun.	27	114 29 26.7	121 30 56.8	1 24 51.8	S. 0 48 35.3	21.9	18 1.8
Mon.	28	128 33 18.8	135 36 28.2	S. 0 11 29.7	N. 0 25 50.2	22.9	19 1.8
Tues.	29	142 40 19.4	149 44 44.6	N. 1 2 49.3	1 38 51.9	23.9	19 1.8
Wed.	30	156 49 33.4	163 54 31.6	2 13 23.1	2 45 49.2	24.9	19 1.8
Thur.	31	170 59 20.8	178 3 38.1	3 15 39.2	3 42 24.1	25.9	19 1.8
Frid.	32	185 6 57.0	192 8 47.7	N. 4 5 39.0	N. 4 25 3.2	26.9	19 1.8



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>th</sup> .
<i>TUESDAY 1.</i>				<i>THURSDAY 3.</i>			
0	8 58 21.06	N. 17 3 46.1	70.35	0	10 54 26.91	N. 9 34 30.3	113.4
1	9 0 49.77	16 56 44.0	71.52	1	10 56 47.91	9 23 11.9	113.4
2	9 3 18.35	16 49 34.9	72.65	2	10 59 8.74	9 11 50.1	114.2
3	9 5 46.81	16 42 19.0	73.78	3	11 1 29.41	9 0 25.0	114.7
4	9 8 15.14	16 34 56.3	74.90	4	11 3 49.90	8 48 56.5	115.2
5	9 10 43.34	16 27 26.9	76.03	5	11 6 10.23	8 37 25.0	115.7
6	9 13 11.40	16 19 50.7	77.12	6	11 8 30.39	8 25 50.3	116.2
7	9 15 39.32	16 12 8.0	78.23	7	11 10 50.38	8 14 12.6	116.7
8	9 18 7.11	16 4 18.6	79.32	8	11 13 10.21	8 2 32.0	117.2
9	9 20 34.76	15 56 22.7	80.38	9	11 15 29.88	7 50 48.6	117.7
10	9 23 2.26	15 48 20.4	81.45	10	11 17 49.38	7 39 2.4	118.1
11	9 25 29.61	15 40 11.7	82.52	11	11 20 8.72	7 27 13.6	118.5
12	9 27 56.82	15 31 56.6	83.55	12	11 22 27.90	7 15 22.2	118.9
13	9 30 23.88	15 23 35.3	84.60	13	11 24 46.92	7 3 28.3	119.3
14	9 32 50.78	15 15 7.7	85.62	14	11 27 5.79	6 51 32.1	119.7
15	9 35 17.54	15 6 34.0	86.62	15	11 29 24.50	6 39 33.5	120.1
16	9 37 44.13	14 57 54.3	87.63	16	11 31 43.05	6 27 32.7	120.4
17	9 40 10.57	14 49 8.5	88.62	17	11 34 1.45	6 15 29.8	120.8
18	9 42 36.85	14 40 16.8	89.60	18	11 36 19.70	6 3 24.9	121.1
19	9 45 2.97	14 31 19.2	90.57	19	11 38 37.79	5 51 18.0	121.4
20	9 47 28.93	14 22 15.8	91.52	20	11 40 55.74	5 39 9.2	121.7
21	9 49 54.73	14 13 6.7	92.47	21	11 43 13.53	5 26 58.6	122.0
22	9 52 20.36	14 3 51.9	93.38	22	11 45 31.18	5 14 46.4	122.3
23	9 54 45.83	N. 13 54 31.6	94.32	23	11 47 48.69	N. 5 2 32.5	122.5
<i>WEDNESDAY 2.</i>				<i>FRIDAY 4.</i>			
0	9 57 11.13	N. 13 45 5.7	95.22	0	11 50 6.04	N. 4 50 17.1	122.8
1	9 59 36.26	13 35 34.4	96.12	1	11 52 23.26	4 38 0.3	123.1
2	10 2 1.23	13 25 57.7	97.00	2	11 54 40.34	4 25 42.1	123.4
3	10 4 26.03	13 16 15.7	97.87	3	11 56 57.27	4 13 22.7	123.7
4	10 6 50.65	13 6 28.5	98.72	4	11 59 14.08	4 1 2.1	123.9
5	10 9 15.11	12 56 36.2	99.57	5	12 1 30.74	3 48 40.4	124.2
6	10 11 39.39	12 46 38.8	100.40	6	12 3 47.27	3 36 17.7	124.4
7	10 14 3.51	12 36 36.4	101.22	7	12 6 3.67	3 23 54.1	124.7
8	10 16 27.45	12 26 29.1	102.02	8	12 8 19.94	3 11 29.7	124.9
9	10 18 51.21	12 16 17.0	102.82	9	12 10 36.09	2 59 4.5	125.1
10	10 21 14.81	12 6 0.1	103.60	10	12 12 52.10	2 46 38.7	125.4
11	10 23 38.23	11 55 38.5	104.35	11	12 15 7.99	2 34 12.2	125.6
12	10 26 1.47	11 45 12.4	105.10	12	12 17 23.76	2 21 45.3	125.9
13	10 28 24.54	11 34 41.8	105.85	13	12 19 39.41	2 9 18.0	126.1
14	10 30 47.44	11 24 6.7	106.57	14	12 21 54.93	1 56 50.3	126.4
15	10 33 10.17	11 13 27.3	107.28	15	12 24 10.34	1 44 22.4	126.7
16	10 35 32.72	11 2 43.6	107.98	16	12 26 25.63	1 31 54.3	126.9
17	10 37 55.10	10 51 55.7	108.67	17	12 28 40.81	1 19 26.1	127.2
18	10 40 17.30	10 41 3.7	109.33	18	12 30 55.88	1 6 58.0	127.4
19	10 42 39.34	10 30 7.7	109.98	19	12 33 10.84	0 54 29.9	127.7
20	10 45 1.20	10 19 7.8	110.63	20	12 35 25.69	0 42 2.0	127.9
21	10 47 22.88	10 8 4.0	111.27	21	12 37 40.44	0 29 34.4	128.2
22	10 49 44.40	9 56 56.4	111.87	22	12 39 55.08	0 17 7.1	128.4
23	10 52 5.74	9 45 45.2	112.48	23	12 42 9.62	N. 0 4 40.2	128.7
24	10 54 26.91	N. 9 34 30.3		24	12 44 24.05	S. 0 7 46.2	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 5.				MONDAY 7.			
0	12 41 24.05	S. 0 7 46.2	124.30	0	14 30 34.96	S. 9 30 45.8	105.58
1	12 46 38.39	0 20 12.0	124.20	1	14 32 46.65	9 41 19.3	104.93
2	12 48 52.63	0 32 37.2	124.07	2	14 34 58.32	9 51 48.9	104.28
3	12 51 6.78	0 45 1.6	123.93	3	14 37 9.97	10 2 14.6	103.62
4	12 53 20.83	0 57 25.2	123.80	4	14 39 21.60	10 12 36.3	102.95
5	12 55 34.80	1 9 48.0	123.62	5	14 41 33.22	10 22 54.0	102.27
6	12 57 48.68	1 22 9.7	123.45	6	14 43 44.82	10 33 7.6	101.58
7	13 0 2.46	1 34 30.4	123.27	7	14 45 56.40	10 43 17.1	100.88
8	13 2 16.17	1 46 50.0	123.05	8	14 48 7.97	10 53 22.4	100.18
9	13 4 29.79	1 59 8.3	122.85	9	14 50 19.53	11 3 23.5	99.47
10	13 6 43.33	2 11 25.4	122.62	10	14 52 31.08	11 13 20.3	98.75
11	13 8 56.79	2 23 41.1	122.38	11	14 54 42.61	11 23 12.8	98.03
12	13 11 10.18	2 35 55.4	122.13	12	14 56 54.14	11 33 1.0	97.30
13	13 13 23.49	2 48 8.2	121.85	13	14 59 5.65	11 42 44.8	96.55
14	13 15 36.72	3 0 19.3	121.60	14	15 1 17.16	11 52 24.1	95.80
15	13 17 49.88	3 12 28.9	121.28	15	15 3 28.66	12 1 58.9	95.05
16	13 20 2.97	3 24 36.6	121.00	16	15 5 40.14	12 11 29.2	94.28
17	13 22 16.00	3 36 42.6	120.68	17	15 7 51.62	12 20 54.9	93.52
18	13 24 28.95	3 48 46.7	120.37	18	15 10 3.10	12 30 16.0	92.73
19	13 26 41.84	4 0 48.9	120.03	19	15 12 14.56	12 39 32.4	91.95
20	13 28 54.67	4 12 49.1	119.67	20	15 14 26.02	12 48 44.1	91.17
21	13 31 7.44	4 24 47.1	119.32	21	15 16 37.48	12 57 51.1	90.37
22	13 33 20.15	4 36 43.0	118.95	22	15 18 48.92	13 6 53.3	89.57
23	13 35 32.80	S. 4 48 36.7	118.57	23	15 21 0.37	S. 13 15 50.7	88.75
SUNDAY 6.				TUESDAY 8.			
0	13 37 45.40	S. 5 0 28.1	118.17	0	15 23 11.81	S. 13 24 43.2	87.93
1	13 39 57.94	5 12 17.1	117.77	1	15 25 23.25	13 33 30.8	87.12
2	13 42 10.43	5 24 3.7	117.37	2	15 27 34.68	13 42 13.5	86.28
3	13 44 22.87	5 35 47.9	116.92	3	15 29 46.11	13 50 51.2	85.45
4	13 46 35.25	5 47 29.4	116.48	4	15 31 57.53	13 59 23.9	84.60
5	13 48 47.59	5 59 8.3	116.05	5	15 34 8.96	14 7 51.5	83.77
6	13 50 59.89	6 10 44.6	115.58	6	15 36 20.37	14 16 14.1	82.92
7	13 53 12.14	6 22 18.1	115.10	7	15 38 31.79	14 24 31.6	82.05
8	13 55 24.35	6 33 48.7	114.63	8	15 40 43.20	14 32 43.9	81.20
9	13 57 36.51	6 45 16.5	114.13	9	15 42 54.61	14 40 51.1	80.32
10	13 59 48.64	6 56 41.3	113.63	10	15 45 6.01	14 48 53.0	79.47
11	14 2 0.72	7 8 3.1	113.13	11	15 47 17.41	14 56 49.8	78.57
12	14 4 12.77	7 19 21.9	112.60	12	15 49 28.80	15 4 41.2	77.7
13	14 6 24.78	7 30 37.5	112.08	13	15 51 40.19	15 12 27.4	
14	14 8 36.76	7 41 50.0	111.52	14	15 53 51.58	15 20 8.0	
15	14 10 48.71	7 52 59.1	110.98	15	15 56 2.97	15 27 43	
16	14 13 0.62	8 4 5.0	110.42	16	15 58 14.35	15 35	
17	14 15 12.51	8 15 7.5	109.85	17	16 0 25.73	15 42	
18	14 17 24.36	8 26 6.6	109.27	18	16 2 37.10	15 4	
19	14 19 36.19	8 37 2.2	108.67	19	16 4 48.47	15	
20	14 21 48.00	8 47 54.2	108.07	20	16 6 59.83	16	
21	14 23 59.77	8 58 42.6	107.47	21	16 9 11.18	16	
22	14 26 11.52	9 9 27.4	106.85	22	16 11 22.53	16	
23	14 28 23.25	9 20 8.5	106.22	23	16 13 33.87	16	
24	14 30 34.96	S. 9 30 45.8		24	16 15 45.20	S. 1	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
WEDNESDAY 9.				FRIDAY 11.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	16 15 45.20	S. 16 31 57.5	66.75	0	18 0 24.66	S. 20 2 16.7	19.78
1	16 17 56.53	16 38 38.0	65.80	1	18 2 34.53	20 4 13.0	18.45
2	16 20 7.85	16 45 12.8	64.87	2	18 4 44.34	20 6 3.2	17.20
3	16 22 19.15	16 51 42.0	63.92	3	18 6 54.09	20 7 47.5	16.30
4	16 24 30.45	16 58 5.5	62.97	4	18 9 3.78	20 9 25.7	15.30
5	16 26 41.74	17 4 23.3	62.02	5	18 11 13.40	20 10 57.9	14.37
6	16 28 53.02	17 10 35.4	61.07	6	18 13 22.96	20 12 24.1	13.38
7	16 31 4.29	17 16 41.8	60.10	7	18 15 32.46	20 13 44.4	12.37
8	16 33 15.54	17 22 42.4	59.15	8	18 17 41.89	20 14 58.6	11.38
9	16 35 26.79	17 28 37.3	58.18	9	18 19 51.24	20 16 6.9	10.38
10	16 37 38.02	17 34 26.4	57.20	10	18 22 0.53	20 17 9.2	9.38
11	16 39 49.23	17 40 9.6	56.25	11	18 24 9.75	20 18 5.5	8.38
12	16 42 0.42	17 45 47.1	55.27	12	18 26 18.90	20 18 55.9	7.40
13	16 44 11.60	17 51 18.7	54.30	13	18 28 27.97	20 19 40.3	6.43
14	16 46 22.77	17 56 44.5	53.32	14	18 30 36.97	20 20 18.8	5.43
15	16 48 33.91	18 2 4.4	52.35	15	18 32 45.89	20 20 51.4	4.43
16	16 50 45.04	18 7 18.5	51.37	16	18 34 54.73	20 21 18.0	3.43
17	16 52 56.15	18 12 26.7	50.37	17	18 37 3.50	20 21 38.8	2.43
18	16 55 7.24	18 17 28.9	49.40	18	18 39 12.18	20 21 53.6	1.43
19	16 57 18.30	18 22 25.3	48.42	19	18 41 20.78	20 22 2.5	0.43
20	16 59 29.34	18 27 15.8	47.42	20	18 43 29.30	20 22 5.6	0.43
21	17 1 40.36	18 32 0.3	46.43	21	18 45 37.74	20 22 2.8	1.43
22	17 3 51.35	18 36 38.9	45.43	22	18 47 46.09	20 21 54.1	2.43
23	17 6 2.32	S. 18 41 11.5	44.45	23	18 49 54.35	S. 20 21 39.6	3.43
THURSDAY 10.				SATURDAY 12.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	17 8 13.27	S. 18 45 38.2	43.45	0	18 52 2.53	S. 20 21 19.2	4.37
1	17 10 24.18	18 49 58.9	42.47	1	18 54 10.62	20 20 53.0	5.33
2	17 12 35.07	18 54 13.7	41.45	2	18 56 18.62	20 20 21.0	6.28
3	17 14 45.92	18 58 22.4	40.47	3	18 58 26.53	20 19 43.2	7.27
4	17 16 56.74	19 2 25.2	39.47	4	19 0 34.35	20 18 59.6	8.21
5	17 19 7.53	19 6 22.0	38.47	5	19 2 42.08	20 18 10.3	9.18
6	17 21 18.29	19 10 12.8	37.47	6	19 4 49.71	20 17 15.2	10.18
7	17 23 29.01	19 13 57.6	36.45	7	19 6 57.25	20 16 14.3	11.14
8	17 25 39.69	19 17 36.3	35.47	8	19 9 4.70	20 15 7.7	12.08
9	17 27 50.34	19 21 9.1	34.45	9	19 11 12.04	20 13 55.4	13.00
10	17 30 0.95	19 24 35.8	33.45	10	19 13 19.30	20 12 37.4	13.99
11	17 32 11.52	19 27 56.5	32.45	11	19 15 26.45	20 11 13.8	14.98
12	17 34 22.04	19 31 11.2	31.43	12	19 17 33.50	20 9 44.4	15.88
13	17 36 32.52	19 34 19.8	30.45	13	19 19 40.45	20 8 9.4	16.77
14	17 38 42.96	19 37 22.5	29.42	14	19 21 47.30	20 6 28.8	17.71
15	17 40 53.36	19 40 19.0	28.43	15	19 23 54.05	20 4 42.5	18.61
16	17 43 3.71	19 43 9.6	27.42	16	19 26 0.70	20 2 50.7	19.51
17	17 45 14.01	19 45 54.1	26.40	17	19 28 7.25	20 0 53.3	20.54
18	17 47 24.26	19 48 32.5	25.42	18	19 30 13.69	19 58 50.3	21.43
19	17 49 34.46	19 51 5.0	24.40	19	19 32 20.03	19 56 41.7	22.31
20	17 51 44.61	19 53 31.4	23.40	20	19 34 26.26	19 54 27.6	23.21
21	17 53 54.70	19 55 51.8	22.38	21	19 36 32.38	19 52 8.1	24.11
22	17 56 4.75	19 58 6.1	21.38	22	19 38 38.41	19 49 43.0	25.11
23	17 58 14.74	20 0 14.4	20.38	23	19 40 44.32	19 47 12.4	26.08
24	18 0 24.66	S. 20 2 16.7		24	19 42 50.12	S. 19 44 36.4	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 13.				TUESDAY 15.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	19 42 50.12	S. 19 44 36.4	26.92	0	21 21 17.25	S. 15 59 51.7	66.03
1	19 44 55.81	19 41 54.9	27.80	1	21 23 17.64	15 53 15.5	66.75
2	19 47 1.40	19 39 8.1	28.72	2	21 25 17.94	15 46 35.0	67.45
3	19 49 6.88	19 36 15.8	29.62	3	21 27 18.13	15 39 50.3	68.17
4	19 51 12.24	19 33 18.1	30.50	4	21 29 18.23	15 33 1.3	68.85
5	19 53 17.50	19 30 15.1	31.38	5	21 31 18.23	15 26 8.2	69.57
6	19 55 22.64	19 27 6.8	32.28	6	21 33 18.14	15 19 10.8	70.23
7	19 57 27.67	19 23 53.1	33.15	7	21 35 17.95	15 12 9.4	70.93
8	19 59 32.60	19 20 34.2	34.05	8	21 37 17.66	15 5 3.8	71.62
9	20 1 37.40	19 17 9.9	34.92	9	21 39 17.28	14 57 54.1	72.28
10	20 3 42.10	19 13 40.4	35.78	10	21 41 16.81	14 50 40.4	72.95
11	20 5 46.68	19 10 5.7	36.65	11	21 43 16.25	14 43 22.7	73.63
12	20 7 51.15	19 6 25.8	37.52	12	21 45 15.60	14 36 0.9	74.28
13	20 9 55.51	19 2 40.7	38.38	13	21 47 14.86	14 28 35.2	74.95
14	20 11 59.75	18 58 50.4	39.23	14	21 49 14.04	14 21 5.5	75.58
15	20 14 3.88	18 54 55.0	40.10	15	21 51 13.13	14 13 32.0	76.25
16	20 16 7.90	18 50 54.4	40.93	16	21 53 12.14	14 5 54.5	76.88
17	20 18 11.80	18 46 48.8	41.78	17	21 55 11.06	13 58 13.2	77.53
18	20 20 15.59	18 42 38.1	42.63	18	21 57 9.90	13 50 28.0	78.15
19	20 22 19.27	18 38 22.3	43.47	19	21 59 8.66	13 42 39.1	78.78
20	20 24 22.83	18 34 1.5	44.32	20	22 1 7.34	13 34 46.4	79.42
21	20 26 26.28	18 29 35.6	45.13	21	22 3 5.95	13 26 49.9	80.02
22	20 28 29.61	18 25 4.8	45.97	22	22 5 4.48	13 18 49.8	80.65
23	20 30 32.83	S. 18 20 29.0	46.78	23	22 7 2.93	S. 13 10 45.9	81.25
MONDAY 14.				WEDNESDAY 16.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	20 32 35.94	S. 18 15 48.3	47.62	0	22 9 1.31	S. 13 2 38.4	81.85
1	20 34 38.93	18 11 2.6	48.42	1	22 10 59.62	12 54 27.3	82.45
2	20 36 41.81	18 6 12.1	49.23	2	22 12 57.86	12 46 12.6	83.05
3	20 38 44.58	18 1 16.7	50.05	3	22 14 56.03	12 37 54.3	83.63
4	20 40 47.23	17 56 16.4	50.85	4	22 16 54.13	12 29 32.5	84.22
5	20 42 49.77	17 51 11.3	51.65	5	22 18 52.17	12 21 7.2	84.80
6	20 44 52.20	17 46 1.4	52.43	6	22 20 50.15	12 12 38.4	85.37
7	20 46 54.52	17 40 46.8	53.25	7	22 22 48.06	12 4 6.2	85.93
8	20 48 56.73	17 35 27.3	54.02	8	22 24 45.92	11 55 30.6	86.50
9	20 50 58.82	17 30 3.2	54.80	9	22 26 43.71	11 46 51.6	87.05
10	20 53 0.81	17 24 34.4	55.58	10	22 28 41.45	11 38 9.3	87.7
11	20 55 2.68	17 19 0.9	56.37	11	22 30 39.13	11 29 23.7	88.3
12	20 57 4.44	17 13 22.7	57.13	12	22 32 36.77	11 20 34.8	88.9
13	20 59 6.09	17 7 39.9	57.90	13	22 34 34.35	11 11 42.7	
14	21 1 7.64	17 1 52.5	58.65	14	22 36 31.88	11 2 47.4	
15	21 3 9.08	16 56 0.6	59.42	15	22 38 29.36	10 53 48.5	
16	21 5 10.41	16 50 4.1	60.17	16	22 40 26.80	10 44 47.1	
17	21 7 11.63	16 44 3.1	60.92	17	22 42 24.19	10 35 42.2	
18	21 9 12.74	16 37 57.6	61.67	18	22 44 21.54	10 26 34.1	
19	21 11 13.76	16 31 47.6	62.40	19	22 46 18.85	10 17 23.3	
20	21 13 14.66	16 25 33.2	63.13	20	22 48 16.12	10 8 11.1	
21	21 15 15.46	16 19 14.4	63.87	21	22 50 13.35	9 58 58.8	
22	21 17 16.16	16 12 51.2	64.60	22	22 52 10.56	9 49 49.9	
23	21 19 16.76	16 6 23.6	65.32	23	22 54 7.72	9 40 40.0	
24	21 21 17.25	S. 15 59 51.7		24	22 56 4.86	S. 9 30 30.0	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff.
THURSDAY 17.				SATURDAY 19.			
0	22 56 4.86	S. 9 30 44.7	94.75	0	0 29 54.43	S. 1 13 52.5	110
1	22 58 1.97	9 21 16.2	95.22	1	0 31 52.82	1 2 52.4	111
2	22 59 59.05	9 11 44.9	95.68	2	0 33 51.30	0 51 51.4	112
3	23 1 56.10	9 2 10.8	96.13	3	0 35 49.87	0 40 49.6	113
4	23 3 53.14	8 52 34.0	96.58	4	0 37 48.53	0 29 47.0	114
5	23 5 50.15	8 42 54.5	97.03	5	0 39 47.29	0 18 43.7	115
6	23 7 47.15	8 33 12.3	97.48	6	0 41 46.14	S. 0 7 39.7	116
7	23 9 44.13	8 23 27.1	97.90	7	0 43 45.09	N. 0 3 24.9	117
8	23 11 41.09	8 13 40.0	98.33	8	0 45 44.15	0 14 30.1	118
9	23 13 38.04	8 3 50.0	98.75	9	0 47 43.30	0 25 35.9	119
10	23 15 34.99	7 53 57.5	99.17	10	0 49 42.57	0 36 42.1	120
11	23 17 31.92	7 44 2.5	99.58	11	0 51 41.94	0 47 48.7	121
12	23 19 28.85	7 34 5.0	99.98	12	0 53 41.42	0 58 55.7	122
13	23 21 25.78	7 24 5.1	100.37	13	0 55 41.02	1 10 3.1	123
14	23 23 22.70	7 14 2.9	100.77	14	0 57 40.74	1 21 10.7	124
15	23 25 19.63	7 3 58.3	101.15	15	0 59 40.57	1 32 18.5	125
16	23 27 16.56	6 53 51.4	101.53	16	1 1 40.53	1 43 26.6	126
17	23 29 13.50	6 43 42.2	101.88	17	1 3 40.61	1 54 34.7	127
18	23 31 10.44	6 33 30.9	102.27	18	1 5 40.83	2 5 43.0	128
19	23 33 7.40	6 23 17.3	102.62	19	1 7 41.17	2 16 51.2	129
20	23 35 4.37	6 13 1.6	102.98	20	1 9 41.64	2 27 59.4	130
21	23 37 1.35	6 2 43.7	103.32	21	1 11 42.24	2 39 7.5	131
22	23 38 58.35	5 52 23.8	103.65	22	1 13 42.99	2 50 15.5	132
23	23 40 55.38	S. 5 42 1.9	104.00	23	1 15 43.87	N. 3 1 23.2	133
FRIDAY 18.				SUNDAY 20.			
0	23 42 52.42	S. 5 31 37.9	104.32	0	1 17 44.90	N. 3 12 30.7	134
1	23 44 49.49	5 21 12.0	104.63	1	1 19 46.07	3 23 37.9	135
2	23 46 46.58	5 10 44.2	104.95	2	1 21 47.39	3 34 44.7	136
3	23 48 43.71	5 0 14.5	105.25	3	1 23 48.87	3 45 51.1	137
4	23 50 40.87	4 49 43.0	105.57	4	1 25 50.49	3 56 57.0	138
5	23 52 38.06	4 39 9.6	105.83	5	1 27 52.27	4 8 2.4	139
6	23 54 35.28	4 28 34.6	106.13	6	1 29 54.21	4 19 7.2	140
7	23 56 32.55	4 17 57.8	106.42	7	1 31 56.30	4 30 11.4	141
8	23 58 29.86	4 7 19.3	106.67	8	1 33 58.57	4 41 14.8	142
9	0 0 27.21	3 56 39.3	106.95	9	1 36 0.99	4 52 17.5	143
10	0 2 24.61	3 45 57.6	107.20	10	1 38 3.58	5 3 19.4	144
11	0 4 22.05	3 35 14.4	107.45	11	1 40 6.35	5 14 20.4	145
12	0 6 19.55	3 24 29.7	107.70	12	1 42 9.28	5 25 20.5	146
13	0 8 17.10	3 13 43.5	107.92	13	1 44 12.39	5 36 19.6	147
14	0 10 14.71	3 2 56.0	108.15	14	1 46 15.67	5 47 17.7	148
15	0 12 12.37	2 52 7.1	108.38	15	1 48 19.14	5 58 14.6	149
16	0 14 10.10	2 41 16.8	108.58	16	1 50 22.78	6 9 10.4	150
17	0 16 7.89	2 30 25.3	108.80	17	1 52 26.61	6 20 4.9	151
18	0 18 5.75	2 19 32.5	109.00	18	1 54 30.62	6 30 58.2	152
19	0 20 3.68	2 8 38.5	109.18	19	1 56 34.83	6 41 50.1	153
20	0 22 1.67	1 57 43.4	109.37	20	1 58 39.22	6 52 40.6	154
21	0 23 59.75	1 46 47.2	109.53	21	2 0 43.81	7 3 29.6	155
22	0 25 57.89	1 35 50.0	109.72	22	2 2 48.59	7 14 17.1	156
23	0 27 56.12	1 24 51.7	109.87	23	2 4 53.57	7 25 3.0	157
24	0 29 54.43	S. 1 13 52.5		24	2 6 58.74	N. 7 35 47.3	158



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 21.				WEDNESDAY 23.			
0	2 6 58.74	N. 7 35 47.3	107.08	0	3 51 34.78	N. 15 17 39.1	80.57
1	2 9 4.12	7 46 29.8	106.80	1	3 53 51.57	15 25 42.5	79.73
2	2 11 9.70	7 57 10.6	106.48	2	3 56 8.61	15 33 40.9	78.90
3	2 13 15.49	8 7 49.5	106.17	3	3 58 25.91	15 41 34.3	78.05
4	2 15 21.48	8 18 26.5	105.83	4	4 0 43.46	15 49 22.6	77.18
5	2 17 27.69	8 29 1.5	105.50	5	4 3 1.26	15 57 5.7	76.33
6	2 19 34.10	8 39 34.5	105.15	6	4 5 19.31	16 4 43.7	75.45
7	2 21 40.73	8 50 5.4	104.80	7	4 7 37.61	16 12 16.4	74.55
8	2 23 47.57	9 0 34.2	104.42	8	4 9 56.17	16 19 43.7	73.67
9	2 25 54.64	9 11 0.7	104.03	9	4 12 14.97	16 27 5.7	72.75
10	2 28 1.92	9 21 24.9	103.65	10	4 14 34.02	16 34 22.2	71.82
11	2 30 9.42	9 31 46.8	103.25	11	4 16 53.32	16 41 33.1	70.90
12	2 32 17.14	9 42 6.3	102.83	12	4 19 12.86	16 48 38.5	69.95
13	2 34 25.09	9 52 23.3	102.40	13	4 21 32.65	16 55 38.2	69.00
14	2 36 33.26	10 2 37.7	101.98	14	4 23 52.68	17 2 32.2	68.03
15	2 38 41.66	10 12 49.6	101.52	15	4 26 12.96	17 9 20.4	67.05
16	2 40 50.29	10 22 58.7	101.08	16	4 28 33.47	17 16 2.7	66.08
17	2 42 59.15	10 33 5.2	100.60	17	4 30 54.23	17 22 39.2	65.08
18	2 45 8.24	10 43 8.8	100.12	18	4 33 15.22	17 29 9.7	64.08
19	2 47 17.57	10 53 9.5	99.63	19	4 35 36.45	17 35 34.2	63.08
20	2 49 27.14	11 3 7.3	99.13	20	4 37 57.91	17 41 52.7	62.05
21	2 51 36.94	11 13 2.1	98.62	21	4 40 19.61	17 48 5.0	61.02
22	2 53 46.97	11 22 53.8	98.08	22	4 42 41.53	17 54 11.1	59.97
23	2 55 57.25	N. 11 32 42.3	97.57	23	4 45 3.68	N. 18 0 10.9	58.93
TUESDAY 22.				THURSDAY 24.			
0	2 58 7.77	N. 11 42 27.7	97.02	0	4 47 26.07	N. 18 6 4.5	57.87
1	3 0 18.53	11 52 9.8	96.45	1	4 49 48.68	18 11 51.7	56.82
2	3 2 29.53	12 1 48.5	95.90	2	4 52 11.50	18 17 32.6	55.72
3	3 4 40.78	12 11 23.9	95.30	3	4 54 34.55	18 23 6.9	54.63
4	3 6 52.27	12 20 55.7	94.72	4	4 56 57.81	18 28 34.7	53.55
5	3 9 4.01	12 30 24.0	94.12	5	4 59 21.29	18 33 56.0	52.43
6	3 11 15.99	12 39 48.7	93.50	6	5 1 44.98	18 39 10.6	51.33
7	3 13 28.23	12 49 9.7	92.88	7	5 4 8.89	18 44 18.6	50.20
8	3 15 40.71	12 58 27.0	92.25	8	5 6 32.99	18 49 19.8	49.08
9	3 17 53.44	13 7 40.5	91.58	9	5 8 57.31	18 54 14.3	47.93
10	3 20 6.42	13 16 50.0	90.95	10	5 11 21.82	18 59	0
11	3 22 19.66	13 25 55.7	90.27	11	5 13 46.53	19	2
12	3 24 33.15	13 34 57.3	89.58	12	5 16 11.44	19	10
13	3 26 46.89	13 43 54.8	88.90	13	5 18 36.54		
14	3 29 0.88	13 52 48.2	88.20	14	5 21 1.83		
15	3 31 15.13	14 1 37.4	87.48	15	5 23 27.31		
16	3 33 29.63	14 10 22.3	86.75	16	5 25 52.97		
17	3 35 44.38	14 19 2.8	86.02	17	5 28 18.80		
18	3 37 59.39	14 27 38.9	85.27	18	5 30 44.82		
19	3 40 14.65	14 36 10.5	84.52	19	5 33 11.00		
20	3 42 30.17	14 44 37.6	83.75	20	5 35 37.2		
21	3 44 45.94	14 53 0.1	82.95	21	5 38 3.7		
22	3 47 1.96	15 1 17.8	82.18	22	5 40 30		
23	3 49 18.24	15 9 30.9	81.37	23	5 42 57		
24	3 51 34.78	N. 15 17 39.1		24	5 45 24		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 25.				SUNDAY 27.			
0	5 45 24.37	N.19 53 45.9	29.97	0	7 44 33.93	N.19 50 46.0	22
1	5 47 51.51	19 56 45.7	28.73	1	7 47 2.97	19 47 28.5	24
2	5 50 18.79	19 59 38.1	27.47	2	7 49 31.93	19 44 3.2	25
3	5 52 46.21	20 2 22.9	26.20	3	7 52 0.82	19 40 30.3	26
4	5 55 13.77	20 5 0.1	24.93	4	7 54 29.63	19 36 49.6	28
5	5 57 41.47	20 7 29.7	23.67	5	7 56 58.36	19 33 1.2	29
6	6 0 9.29	20 9 51.7	22.40	6	7 59 27.00	19 29 5.2	30
7	6 2 37.24	20 12 6.1	21.12	7	8 1 55.55	19 25 1.6	31
8	6 5 5.30	20 14 12.8	19.82	8	8 4 24.01	19 20 50.4	32
9	6 7 33.49	20 16 11.7	18.55	9	8 6 52.36	19 16 31.6	33
10	6 10 1.78	20 18 3.0	17.23	10	8 9 20.62	19 12 5.3	34
11	6 12 30.18	20 19 46.4	15.95	11	8 11 48.77	19 7 31.5	35
12	6 14 58.68	20 21 22.1	14.65	12	8 14 16.81	19 2 50.2	36
13	6 17 27.28	20 22 50.0	13.33	13	8 16 44.74	18 58 1.5	37
14	6 19 55.98	20 24 10.0	12.05	14	8 19 12.55	18 53 5.4	38
15	6 22 24.76	20 25 22.3	10.72	15	8 21 40.25	18 48 2.0	39
16	6 24 53.63	20 26 26.6	9.42	16	8 24 7.82	18 42 51.2	40
17	6 27 22.58	20 27 23.1	8.08	17	8 26 35.27	18 37 33.2	41
18	6 29 51.60	20 28 11.6	6.78	18	8 29 2.59	18 32 8.0	42
19	6 32 20.69	20 28 52.3	5.45	19	8 31 29.78	18 26 35.3	43
20	6 34 49.85	20 29 25.0	4.13	20	8 33 56.83	18 20 55.9	44
21	6 37 19.07	20 29 49.8	2.80	21	8 36 23.75	18 15 9.3	45
22	6 39 48.35	20 30 6.6	1.48	22	8 38 50.53	18 9 15.5	46
23	6 42 17.67	N.20 30 15.5	0.15	23	8 41 17.17	N.18 3 14.7	47
SATURDAY 26.				MONDAY 28.			
0	6 44 47.05	N.20 30 16.4	1.18	0	8 43 43.66	N.17 57 7.0	48
1	6 47 16.47	20 30 9.3	2.52	1	8 46 10.01	17 50 52.4	49
2	6 49 45.92	20 29 54.2	3.83	2	8 48 36.20	17 44 30.8	50
3	6 52 15.41	20 29 31.2	5.18	3	8 51 2.25	17 38 2.5	51
4	6 54 44.93	20 29 0.1	6.50	4	8 53 28.14	17 31 27.4	52
5	6 57 14.47	20 28 21.1	7.85	5	8 55 53.87	17 24 45.5	53
6	6 59 44.03	20 27 34.0	9.17	6	8 58 19.45	17 17 57.0	54
7	7 2 13.60	20 26 39.0	10.52	7	9 0 44.86	17 11 1.9	55
8	7 4 43.18	20 25 35.9	11.83	8	9 3 10.12	17 4 0.2	56
9	7 7 12.76	20 24 24.9	13.17	9	9 5 35.21	16 56 52.0	57
10	7 9 42.35	20 23 5.9	14.50	10	9 8 0.13	16 49 37.4	58
11	7 12 11.93	20 21 38.9	15.83	11	9 10 24.89	16 42 16.3	59
12	7 14 41.50	20 20 3.9	17.17	12	9 12 49.47	16 34 48.9	60
13	7 17 11.06	20 18 20.9	18.48	13	9 15 13.89	16 27 15.2	61
14	7 19 40.59	20 16 30.0	19.80	14	9 17 38.13	16 19 35.3	62
15	7 22 10.11	20 14 31.2	21.15	15	9 20 2.21	16 11 49.2	63
16	7 24 39.59	20 12 24.3	22.45	16	9 22 26.11	16 3 57.0	64
17	7 27 9.04	20 10 9.6	23.77	17	9 24 49.83	15 55 58.7	65
18	7 29 38.46	20 7 47.0	25.08	18	9 27 13.38	15 47 54.4	66
19	7 32 7.83	20 5 16.5	26.40	19	9 29 36.75	15 39 44.2	67
20	7 34 37.16	20 2 38.1	27.72	20	9 31 59.95	15 31 28.1	68
21	7 37 6.44	19 59 51.8	29.02	21	9 34 22.96	15 23 6.2	69
22	7 39 35.66	19 56 57.7	30.32	22	9 36 45.80	15 14 38.5	70
23	7 42 4.83	19 53 55.8	31.63	23	9 39 8.46	15 6 5.2	71
24	7 44 33.93	N.19 50 46.0		24	9 41 30.93	N.14 57 26.2	72



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 29.				THURSDAY 31.			
0	9 41 30.93	N. 14 57 26.2	87.42	0	11 32 3.71	N. 6 34 13.9	118.28
1	9 43 53.22	14 48 41.7	88.35	1	11 34 18.04	6 22 24.2	118.62
2	9 46 15.33	14 39 51.6	89.25	2	11 36 32.25	6 10 32.5	118.95
3	9 48 37.26	14 30 56.1	90.13	3	11 38 46.33	5 58 38.8	119.27
4	9 50 59.01	14 21 55.3	91.03	4	11 41 0.28	5 46 43.2	119.57
5	9 53 20.58	14 12 49.1	91.90	5	11 43 14.11	5 34 45.8	119.87
6	9 55 41.96	14 3 37.7	92.75	6	11 45 27.82	5 22 46.6	120.15
7	9 58 3.16	13 54 21.2	93.62	7	11 47 41.41	5 10 45.7	120.40
8	10 0 24.18	13 44 59.5	94.45	8	11 49 54.89	4 58 43.3	120.67
9	10 2 45.01	13 35 32.8	95.28	9	11 52 8.25	4 46 39.3	120.92
10	10 5 5.66	13 26 1.1	96.10	10	11 54 21.49	4 34 33.8	121.13
11	10 7 26.13	13 16 24.5	96.90	11	11 56 34.63	4 22 27.0	121.35
12	10 9 46.42	13 6 43.1	97.70	12	11 58 47.66	4 10 18.9	121.55
13	10 12 6.53	12 56 56.9	98.47	13	12 1 0.59	3 58 9.6	121.75
14	10 14 26.46	12 47 6.1	99.25	14	12 3 13.41	3 45 59.1	121.93
15	10 16 46.20	12 37 10.6	100.02	15	12 5 26.14	3 33 47.5	122.08
16	10 19 5.77	12 27 10.5	100.75	16	12 7 38.77	3 21 35.0	122.25
17	10 21 25.16	12 17 6.0	101.50	17	12 9 51.30	3 9 21.5	122.38
18	10 23 44.38	12 6 57.0	102.22	18	12 12 3.74	2 57 7.2	122.52
19	10 26 3.41	11 56 43.7	102.93	19	12 14 16.08	2 44 52.1	122.63
20	10 28 22.27	11 46 26.1	103.62	20	12 16 28.34	2 32 36.3	122.73
21	10 30 40.95	11 36 4.4	104.33	21	12 18 40.52	2 20 19.9	122.82
22	10 32 59.46	11 25 38.4	104.98	22	12 20 52.61	2 8 3.0	122.92
23	10 35 17.79	N. 11 15 8.5	105.67	23	12 23 4.61	N. 1 55 45.5	122.97
WEDNESDAY 30.				FRIDAY, NOV. 1.			
0	10 37 35.95	N. 11 4 34.5	106.32	0	12 25 16.53	N. 1 43 27.7	
1	10 39 53.94	10 53 56.6	106.95				
2	10 42 11.76	10 43 14.9	107.60				
3	10 44 29.41	10 32 29.3	108.20				
4	10 46 46.89	10 21 40.1	108.80				
5	10 49 4.21	10 10 47.3	109.40				
6	10 51 21.36	9 59 50.9	109.97				
7	10 53 38.35	9 48 51.1	110.55				
8	10 55 55.17	9 37 47.8	111.10				
9	10 58 11.84	9 26 41.2	111.65				
10	11 0 28.35	9 15 31.3	112.17				
11	11 2 44.70	9 4 18.3	112.68				
12	11 5 0.88	8 53 2.2	113.18				
13	11 7 16.92	8 41 43.1	113.68				
14	11 9 32.81	8 30 21.0	114.17				
15	11 11 48.55	8 18 56.0	114.63				
16	11 14 4.14	8 7 28.2	115.08				
17	11 16 19.58	7 55 57.7	115.53				
18	11 18 34.88	7 44 24.5	115.97				
19	11 20 50.03	7 32 48.7	116.37				
20	11 23 5.05	7 21 10.5	116.78				
21	11 25 19.92	7 9 29.8	117.18				
22	11 27 34.65	6 57 46.7	117.55				
23	11 29 49.25	6 46 1.4	117.92				
24	11 32 3.71	N. 6 34 13.9					

## PHASES OF THE MOON.

- New Moon - - - 5 2  
 ☽ First Quarter - - 12  
 ○ Full Moon - - - 20  
 ☾ Last Quarter - - 27

☾ P.  
 ☾ A.  
 ☾ I.



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .
1	Aldebaran W.	64 33 50 2188	66 22 35 2182	68 11 29 2178	70 0 29			
	Pollux W.	22 1 23 2535	23 41 48 2483	25 23 25 2440	27 6 3			
	SUN E.	55 47 17 2512	54 6 20 2507	52 25 16 2502	50 44 6			
2	Aldebaran W.	79 7 7 2156	80 56 41 2154	82 46 18 2153	84 35 5			
	Pollux W.	35 49 28 2295	37 35 35 2282	39 22 1 2271	41 8 43			
	SUN E.	42 17 11 2487	40 35 40 2483	38 51 10 2488	37 12 40			
3	Aldebaran W.	93 41 28 2152	95 34 8 2155	97 23 44 2156	99 13 18			
	Pollux W.	50 5 8 2233	51 52 46 2231	53 40 27 2230	55 28 10			
	SUN E.	28 46 10 2513	27 5 15 2522	25 24 33 2534	23 44 7			
7	SUN W.	21 59 56 2850	26 33 19 2860	28 6 29 2871	29 39 25			
	Antares E.	30 47 59 2687	29 11 1 2728	27 31 58 2775	25 59 57			
	$\alpha$ Aquilæ E.	79 56 30 3020	78 26 42 3013	76 57 22 3067	75 28 32			
8	SUN W.	37 19 50 2956	38 50 58 2971	40 21 47 2986	41 52 17			
	$\alpha$ Aquilæ E.	68 12 23 3235	66 46 55 3268	65 22 6 3303	63 57 58			
	Fomalhaut E.	100 59 38 2845	99 26 9 2859	97 52 58 2873	96 20 5			
9	SUN W.	49 19 43 3084	50 48 12 3101	52 16 21 3116	53 44 11			
	$\alpha$ Aquilæ E.	57 8 12 3546	55 48 39 3594	54 29 58 3646	53 12 13			
	Fomalhaut E.	88 40 28 2966	87 9 33 2982	85 38 58 2999	84 8 44			
10	$\alpha$ Pegasi E.	103 47 18 3078	102 18 42 3091	100 50 21 3101	99 22 13			
	SUN W.	60 58 34 3209	62 24 33 3225	63 50 13 3238	65 15 37			
	Venus W.	16 20 25 3831	17 34 55 3750	18 50 49 3689	20 7 48			
11	$\alpha$ Aquilæ E.	46 58 50 4025	45 47 35 4106	44 37 39 4192	43 29 5			
	Fomalhaut E.	76 42 50 3101	75 14 42 3120	73 46 57 3137	72 19 32			
	$\alpha$ Pegasi E.	92 5 23 3179	90 38 49 3192	89 12 30 3206	87 46 28			
12	Saturn E.	119 58 33 2808	118 24 15 2822	116 50 16 2835	115 16 33			
	SUN W.	72 18 37 3317	73 42 29 3329	75 6 7 3340	76 29 32			
	Venus W.	26 42 1 3529	28 1 53 3519	29 21 56 3512	30 42 7			
13	Antares W.	23 46 52 3279	25 11 28 3252	26 36 36 3232	28 2 7			
	Fomalhaut E.	65 7 59 3248	63 42 47 3267	62 17 57 3288	60 53 31			
	$\alpha$ Pegasi E.	80 40 29 3291	79 16 7 3306	77 52 3 3320	76 28 15			
14	Saturn E.	107 32 5 2908	105 59 56 2919	104 28 1 2929	102 56 19			
	SUN W.	83 23 39 3399	84 45 57 3407	86 8 6 3415	87 30 6			
	Venus W.	37 23 56 3499	38 44 21 3498	40 4 47 3500	41 25 11			
15	Antares W.	35 13 19 3174	36 39 59 3171	38 6 43 3168	39 33 31			
	Fomalhaut E.	53 57 17 3416	52 35 18 3439	51 13 46 3464	49 52 42			
	$\alpha$ Pegasi E.	69 33 37 3412	68 11 34 3428	66 49 49 3444	65 28 22			
16	Saturn E.	95 20 48 2983	93 50 14 2990	92 19 49 2997	90 49 32			
	SUN W.	94 18 18 3449	95 39 39 3454	97 0 55 3457	98 22 7			
	Venus W.	48 7 6 3503	49 27 27 3502	50 47 49 3503	52 8 10			
17	Antares W.	46 48 5 3158	48 15 5 3158	49 42 5 3156	51 9 7			
	Fomalhaut E.	43 15 17 3649	41 57 36 3688	40 40 36 3730	39 24 21			
	$\alpha$ Pegasi E.	58 45 58 3552	57 26 31 3572	56 7 26 3593	54 48 44			
18	Saturn E.	83 19 56 3029	81 50 19 3031	80 20 45 3035	78 51 16			
	SUN W.	105 7 29 3468	106 28 29 3467	107 49 30 3467	109 10 31			
	Venus W.	58 50 13 3495	60 10 43 3493	61 31 15 3489	62 51 51			



MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>h</sup> .	P.L. of diff.	XVIII <sup>h</sup> .	P.L. of diff.	XXI <sup>h</sup> .	P.L. of diff.
		° ' "		° ' "		° ' "		° ' "	
1	Aldebaran W.	71 49 37	2169	73 38 51	2165	75 28 11	2161	77 17 37	2159
	Pollux W.	28 49 31	2375	30 33 41	2350	32 18 27	2328	34 3 45	2311
	SUN E.	49 2 51	2495	47 21 31	2492	45 40 7	2490	43 58 40	2489
2	Aldebaran W.	86 25 39	2151	88 15 21	2150	90 5 4	2150	91 54 47	2151
	Pollux W.	42 55 40	2253	44 42 49	2246	46 30 8	2241	48 17 34	2236
	SUN E.	35 31 12	2492	33 49 48	2495	32 8 28	2500	30 27 15	2506
3	Aldebaran W.	101 2 46	2163	102 52 10	2167	104 41 28	2171	106 30 39	2177
	Pollux W.	57 15 51	2230	59 3 37	2231	60 51 18	2234	62 38 55	2237
	SUN E.	22 3 59	2564	20 24 15	2586	18 45 1	2613	17 6 23	2646
7	SUN W.	31 12 5	2897	32 44 28	2910	34 16 34	2925	35 48 21	2939
	Antares E.	24 26 5	2889	22 53 32	2960	21 22 29	3045	19 53 12	3148
	α Aquilæ E.	74 0 11	3118	72 32 23	3145	71 5 8	3174	69 38 28	3204
8	SUN W.	43 22 27	3019	44 52 16	3035	46 21 45	3052	47 50 54	3068
	α Aquilæ E.	62 34 30	3376	61 11 46	3416	59 49 47	3457	58 28 35	3501
	Fomalhaut E.	94 47 30	2903	93 15 15	2919	91 43 20	2934	90 11 44	2950
9	SUN W.	55 11 41	3149	56 38 51	3163	58 5 44	3179	59 32 18	3194
	α Aquilæ E.	51 55 26	3757	50 39 39	3818	49 24 55	3882	48 11 17	3952
	Fomalhaut E.	82 38 51	3033	81 9 19	3030	79 40 8	3067	78 11 18	3085
	α Pegasi E.	97 54 21	3126	96 26 43	3139	94 59 21	3152	93 32 14	3165
10	SUN W.	66 40 44	3266	68 5 35	3279	69 30 11	3293	70 54 31	3305
	Venus W.	21 25 36	3606	22 44 4	3579	24 3 1	3557	25 22 22	3541
	α Aquilæ E.	42 21 58	4385	41 16 23	4494	40 12 26	4614	39 10 13	4745
	Fomalhaut E.	70 52 30	3173	69 25 49	3192	67 59 30	3211	66 33 34	3229
	α Pegasi E.	86 20 43	3234	84 55 14	3248	83 30 2	3263	82 5 7	3277
	Saturn E.	113 43 8	2861	112 9 59	2873	110 37 6	2885	109 4 28	2897
11	SUN W.	77 52 44	3361	79 15 45	3372	80 38 34	3381	82 1 12	3391
	Venus W.	32 2 23	3503	33 22 44	3502	34 43 6	3499	36 3 31	3499
	Antares W.	29 27 56	3204	30 54 1	3194	32 20 18	3185	33 46 45	3179
	Fomalhaut E.	59 29 27	3328	58 5 48	3348	56 42 32	3369	55 19 42	3393
	α Pegasi E.	75 4 45	3351	73 41 32	3365	72 18 36	3381	70 55 58	3396
	Saturn E.	101 24 50	2949	99 53 33	2958	98 22 27	2967	96 51 33	2974
12	SUN W.	88 51 58	3428	90 13 43	3434	91 35 21	3440	92 56 52	3445
	Venus W.	42 45 36	3501	44 5 59	3501	45 26 22	3502	46 46 44	3502
	Antares W.	41 0 22	3163	42 27 15	3162	43 54 10	3160	45 1	
	Fomalhaut E.	48 32 8	3519	47 12 5	3548	45 52 34	3579	44	
	α Pegasi E.	64 7 15	3478	62 46 26	3495	61 25 56	3514	60	
	Saturn E.	89 19 23	3010	87 49 22	3014	86 19 27	3020	8	
13	SUN W.	99 43 16	3463	101 4 22	3464	102 46 10	3461		
	Venus W.	53 28 32	3501	54 48 55	3500	56			
	Antares W.	52 36 11	3153	54 3 16	3152	55			
	Fomalhaut E.	38 8 54	3827	36 54 20	3884				
	α Pegasi E.	53 30 27	3639	52 12 35	3664				
	Saturn E.	77 21 50	3039	75 52 26	3041				
14	SUN W.	110 31 33	3465	111 52 36	3463				
	Venus W.	64 12 31	3483	65 33 14	3479				



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	
		° ' "		° ' "		° ' "		° ' "	
14	Antares W.	58 24 45	3146	59 51 59	3143	61 19 17	3140	62 46 38	
	α Pegasi E.	48 21 48	3750	47 5 54	3784	45 50 35	3820	44 35 54	
	Saturn E.	71 24 25	3043	69 55 6	3043	68 25 47	3043	66 56 27	
	α Arietis E.	89 34 3	3221	88 8 19	3220	86 42 34	3220	85 16 49	
15	SUN W.	115 56 1	3454	117 17 17	3451	118 38 36	3447	119 59 59	
	Antares W.	70 4 25	3117	71 32 14	3113	73 0 8	3107	74 28 9	
	Venus W.	69 35 52	3464	70 56 56	3459	72 18 6	3454	73 39 22	
	α Pegasi E.	38 33 49	4125	37 24 11	4197	36 15 42	4278	35 8 29	
	Saturn E.	59 29 15	3029	57 59 38	3026	56 29 57	3022	55 0 11	
	α Arietis E.	78 7 49	3213	76 41 55	3212	75 16 0	3209	73 50 2	
16	SUN W.	126 48 20	3415	128 10 19	3408	129 32 26	3402	130 54 40	
	Antares W.	81 50 1	3069	83 18 48	3063	84 47 43	3055	86 16 48	
	Venus W.	80 27 36	3411	81 49 40	3403	83 11 53	3394	84 34 16	
	Saturn E.	47 29 48	2989	45 59 22	2983	44 28 48	2976	42 58 5	
	α Arietis E.	66 39 32	3196	65 13 18	3193	63 47 0	3191	62 20 40	
	Aldebaran E.	97 55 8	3014	96 25 13	3007	94 55 9	3001	93 24 57	
17	Venus W.	91 28 47	3338	92 52 15	3328	94 15 54	3318	95 39 43	
	α Aquilæ W.	51 12 38	3918	52 25 40	3868	53 39 32	3823	54 54 10	
	Saturn E.	35 22 8	2929	33 50 26	2921	32 18 34	2912	30 46 30	
	α Arietis E.	55 8 24	3182	53 41 53	3182	52 15 22	3183	50 48 53	
	Aldebaran E.	85 51 26	2951	84 20 12	2942	82 48 46	2933	81 17 9	
18	Venus W.	102 42 10	3253	104 7 17	3241	105 32 38	3230	106 58 12	
	α Aquilæ W.	61 17 40	3601	62 36 13	3570	63 55 20	3541	65 14 59	
	Fomalhaut W.	27 53 7	4308	28 59 52	4162	30 8 54	4033	31 20 1	
	α Arietis E.	43 37 16	3209	42 11 18	3220	40 45 33	3232	39 20 2	
	Aldebaran E.	73 35 55	2873	72 3 1	2862	70 29 53	2852	68 56 32	
19	α Aquilæ W.	72 0 31	3393	73 22 56	3371	74 45 46	3351	76 8 58	
	Fomalhaut W.	37 40 34	3513	39 0 44	3454	40 22 0	3400	41 44 17	
	α Pegasi W.	27 44 26	5126	28 39 44	4880	29 38 15	4668	30 39 42	
	Aldebaran E.	61 6 14	2785	59 31 27	2775	57 56 26	2763	56 21 10	
	Pollux E.	105 7 40	2835	103 33 58	2823	102 0 0	2811	100 25 47	
20	α Aquilæ W.	83 10 11	3250	84 35 21	3237	86 0 47	3224	87 26 28	
	Fomalhaut W.	48 48 45	3152	50 15 52	3119	51 43 38	3090	53 12 0	
	α Pegasi W.	36 22 57	3830	37 37 28	3739	38 53 34	3656	40 11 8	
	Aldebaran E.	48 21 12	2698	46 44 29	2686	45 7 31	2676	43 30 19	
	Pollux E.	92 30 57	2744	90 55 15	2732	89 19 18	2722	87 43 7	
21	Fomalhaut W.	60 41 52	2944	62 13 15	2924	63 45 4	2905	65 17 17	
	α Pegasi W.	46 57 13	3296	48 21 30	3251	49 46 39	3210	51 12 36	
	Saturn W.	15 36 8	2613	17 14 45	2599	18 53 42	2585	20 32 57	
	Aldebaran E.	35 20 45	2614	33 42 9	2604	32 3 19	2595	30 24 17	
	Pollux E.	79 38 42	2661	78 1 9	2652	76 23 24	2642	74 45 26	
22	Fomalhaut W.	73 3 46	2809	74 38 2	2797	76 12 34	2784	77 47 23	
	α Pegasi W.	58 32 41	3020	60 2 29	2995	61 32 48	2972	63 3 36	
	Saturn W.	28 53 9	2520	30 33 54	2510	32 14 53	2502	33 56 4	
	Pollux E.	66 32 39	2593	64 53 34	2585	63 14 18	2579	61 34 54	
	Regulus E.	102 13 30	2536	100 33 7	2528	98 52 33	2520	97 11 47	



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>		<sup>o</sup> <sup>i</sup> <sup>u</sup>	
14	Antares W.	64 14 2	3134	65 41 31	3130	67 9 4	3126	68 36 42	3122
	α Pegasi E.	43 21 53	3903	42 8 36	3950	40 56 7	4002	39 44 29	4061
	Saturn E.	65 27 5	3040	63 57 42	3038	62 28 16	3035	60 58 47	3033
	α Arietis E.	83 51 3	3219	82 25 17	3218	80 59 29	3217	79 33 40	3215
15	Sun W.	121 21 27	3438	122 43 1	3432	124 4 41	3427	125 26 27	3421
	Antares W.	75 56 17	3096	77 24 31	3090	78 52 53	3083	80 21 23	3077
	Venus W.	75 0 45	3440	76 22 16	3434	77 43 54	3426	79 5 41	3419
	α Pegasi E.	34 2 40	4472	32 58 23	4588	31 55 48	4721	30 55 6	4875
	Saturn E.	53 30 19	3013	52 0 22	3007	50 30 18	3001	49 0 7	2995
	α Arietis E.	72 24 2	3205	70 57 59	3203	69 31 53	3200	68 5 44	3198
16	Sun W.	132 17 2	3387	133 39 33	3380	135 2 12	3373	136 24 59	3365
	Antares W.	87 46 2	3040	89 15 25	3031	90 44 59	3023	92 14 43	3014
	Venus W.	85 56 49	3377	87 19 32	3367	88 42 26	3358	90 5 31	3348
	Saturn E.	41 27 13	2962	39 56 12	2953	38 25 0	2946	36 53 39	2938
	α Arietis E.	60 54 17	3186	59 27 51	3186	58 1 24	3183	56 34 55	3182
	Aldebaran E.	91 54 35	2985	90 24 3	2977	88 53 22	2968	87 22 29	2960
17	Venus W.	97 3 49	3296	98 28 5	3285	99 52 34	3275	101 17 15	3262
	α Aquilæ W.	56 9 32	3742	57 25 35	3703	58 42 19	3667	59 59 41	3633
	Saturn E.	29 14 15	2895	27 41 50	2885	26 9 12	2877	24 36 24	2868
	α Arietis E.	49 22 25	3186	47 55 59	3190	46 29 38	3195	45 3 23	3202
	Aldebaran E.	79 45 19	2914	78 13 18	2903	76 41 3	2893	75 8 35	2884
18	Venus W.	108 24 0	3208	109 50 0	3196	111 16 14	3184	112 42 42	3173
	α Aquilæ W.	66 35 9	3487	67 55 48	3462	69 16 55	3437	70 38 30	3414
	Fomalhaut W.	32 33 0	3820	33 47 42	3731	35 3 56	3650	36 21 36	3578
	α Arietis E.	37 54 49	3266	36 29 58	3289	35 5 34	3316	33 41 41	3349
	Aldebaran E.	67 22 57	2829	65 49 7	2819	64 15 4	2808	62 40 46	2797
19	α Aquilæ W.	77 32 33	3313	78 56 29	3297	80 20 44	3280	81 45 19	3265
	Fomalhaut W.	43 7 32	3304	44 31 39	3261	45 56 36	3222	47 22 19	3186
	α Pegasi W.	31 43 50	4318	32 50 26	4175	33 59 16	4046	35 10 10	3932
	Aldebaran E.	54 45 40	2741	53 9 55	2730	51 33 55	2720	49 57 41	2708
	Pollux E.	98 51 19	2789	97 16 36	2777	95 41 38	2766	94 6 25	2754
20	α Aquilæ W.	88 52 24	3200	90 18 33	3190	91 44 54	3181	93	
	Fomalhaut W.	54 40 56	3035	56 10 25	3010	57 40 25	2986	56	
	α Pegasi W.	41 30 2	3514	42 50 11	3452	44 11 29	3394		
	Aldebaran E.	41 52 52	2655	40 15 11	2645	38 37 17	2634		
	Pollux E.	86 6 41	2701	84 30 2	2690	82 53 9	2680		
21	Fomalhaut W.	66 49 53	2870	68 22 51	2853	69 56 10			
	α Pegasi W.	52 39 18	3138	54 6 42	3105	55 34 40			
	Saturn W.	22 12 29	2562	23 52 16	2551	25 32 11			
	Aldebaran E.	28 45 1	2575	27 5 32	2567	25 25 11			
	Pollux E.	73 7 15	2624	71 28 53	2616	69			
22	Fomalhaut W.	79 22 28	2761	80 57 47	2750	82			
	α Pegasi W.	64 34 51	2931	66 6 31	2911				
	Saturn W.	35 37 28	2484	37 19 4	2475				
	Pollux E.	59 55 20	2566	58 15 38	2550				
	Regulus E.	95 30 49	2503	93 49 40	2495				



MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	P. L. of diff.	
23	Fomalhaut W.	85 45 4	2723	87 21 14	2715	88 57 34	2707	90 34 5	2701	
	α Pegasi W.	70 43 52	2862	72 17 0	2846	73 50 28	2833	75 24 13	2820	
	Saturn W.	42 25 1	2451	44 7 23	2444	45 49 55	2437	47 32 37	2430	
	α Arietis W.	27 37 50	3232	29 3 21	3148	30 30 32	3075	31 59 12	3060	
	Pollux E.	53 15 46	2546	51 35 37	2542	49 55 22	2538	48 15 2	2535	
	Regulus E.	88 45 6	2472	87 3 13	2465	85 21 10	2458	83 38 57	2450	
24	Saturn W.	56 8 34	2398	57 52 12	2391	59 36 0	2386	61 19 55	2380	
	α Arietis W.	39 39 23	2793	41 14 0	2762	42 49 18	2735	44 25 12	2707	
	Pollux E.	39 52 56	2536	38 12 33	2540	36 32 16	2545	34 52 5	2550	
	Regulus E.	75 5 31	2419	73 22 23	2412	71 39 6	2407	69 55 42	2400	
	Jupiter E.	116 38 0	2493	114 56 37	2486	113 15 4	2480	111 33 23	2473	
	SUN E.	137 49 34	2781	136 14 41	2772	134 39 37	2765	133 4 23	2757	
25	Saturn W.	70 1 30	2354	71 46 11	2350	73 30 58	2345	75 15 52	2340	
	α Arietis W.	52 32 12	2613	54 10 50	2599	55 49 47	2584	57 29 4	2570	
	Aldebaran W.	18 54 3	2381	20 38 5	2375	22 22 15	2370	24 6 33	2365	
	Regulus E.	61 16 43	2376	59 32 34	2371	57 48 18	2366	56 3 55	2360	
	Jupiter E.	103 2 59	2448	101 20 32	2443	99 37 58	2438	97 55 18	2430	
	SUN E.	125 5 50	2724	123 29 42	2718	121 53 26	2712	120 17 2	2707	
26	Saturn W.	84 1 55	2320	85 47 25	2317	87 33 0	2313	89 18 41	2310	
	α Arietis W.	65 49 26	2520	67 30 11	2512	69 11 7	2505	70 52 14	2500	
	Aldebaran W.	32 49 45	2344	34 34 41	2339	36 19 44	2335	38 4 52	2330	
	Regulus E.	47 20 32	2342	45 35 34	2339	43 50 31	2335	42 5 23	2330	
	Jupiter E.	89 20 22	2413	87 37 6	2409	85 53 44	2405	84 10 17	2400	
	SUN E.	112 13 21	2683	110 36 18	2678	108 59 9	2674	107 21 51	2670	
27	Saturn W.	98 8 15	2294	99 54 23	2291	101 40 36	2289	103 26 52	2285	
	α Arietis W.	79 20 3	2469	81 2 0	2465	82 44 2	2461	84 26 10	2457	
	Aldebaran W.	46 51 46	2315	48 37 23	2313	50 23 4	2310	52 8 49	2307	
	Regulus E.	33 18 32	2317	31 32 57	2314	29 47 18	2311	28 1 35	2308	
	Jupiter E.	75 31 49	2386	73 47 54	2383	72 3 55	2381	70 19 53	2378	
	SUN E.	99 14 24	2652	97 36 39	2649	95 58 51	2646	94 20 58	2643	
28	Aldebaran W.	60 58 31	2295	62 44 38	2293	64 30 48	2291	66 17 0	2289	
	Pollux W.	18 40 12	2751	20 15 44	2678	21 52 53	2622	23 31 18	2610	
	Jupiter E.	61 38 49	2367	59 54 27	2366	58 10 3	2364	56 25 36	2362	
	SUN E.	86 10 40	2631	84 32 27	2629	82 54 11	2627	81 15 53	2625	
29	Aldebaran W.	75 8 36	2283	76 55 0	2282	78 41 26	2281	80 27 54	2280	
	Pollux W.	31 55 52	2444	33 38 24	2429	35 21 18	2416	37 4 30	2402	
	Jupiter E.	47 43 0	2359	45 58 26	2358	44 13 51	2359	42 29 17	2357	
	SUN E.	73 3 50	2620	71 25 22	2618	69 46 52	2619	68 8 23	2617	
30	Aldebaran W.	89 20 16	2281	91 6 44	2282	92 53 10	2282	94 39 36	2283	
	Pollux W.	45 43 53	2368	47 28 13	2364	49 12 40	2361	50 57 11	2359	
	Regulus W.	9 14 35	2302	11 0 31	2297	12 46 35	2294	14 32 43	2292	
	Jupiter E.	33 46 46	2367	32 2 24	2370	30 18 6	2374	28 33 54	2377	
31	SUN E.	59 55 58	2622	58 17 33	2623	56 39 9	2626	55 0 49	2629	
	Pollux W.	59 40 32	2353	61 25 15	2354	63 9 56	2355	64 54 36	2357	
	Regulus W.	23 23 34	2296	25 9 39	2298	26 55 42	2301	28 41 40	2304	
	SUN E.	46 50 0	2644	45 12 5	2649	43 34 16	2655	41 56 35	2660	



## MEAN TIME.

## LUNAR DISTANCES.

the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
23	Fomalhaut W.	92 10 44	2694	93 47 32	2689	95 24 27	2684	97 1 29	2679
	α Pegasi W.	76 58 14	2808	78 32 31	2798	80 7 2	2788	81 41 46	2779
	Saturn W.	49 15 29	2423	50 58 31	2416	52 41 43	2410	54 25 4	2403
	α Arietis W.	33 29 10	2957	35 0 17	2908	36 32 26	2865	38 5 30	2827
	Pollux E.	46 34 39	2535	44 54 14	2534	43 13 48	2533	41 33 21	2535
	Regulus E.	81 56 35	2443	80 14 2	2438	78 31 21	2431	76 48 30	2425
24	Saturn W.	63 3 59	2375	64 48 10	2369	66 32 29	2364	68 16 56	2359
	α Arietis W.	46 1 40	2686	47 38 38	2666	49 16 4	2646	50 53 56	2629
	Pollux E.	33 12 4	2561	31 32 16	2573	29 52 44	2588	28 13 32	2607
	Regulus E.	68 12 9	2396	66 28 28	2391	64 44 41	2385	63 0 45	2381
	Jupiter E.	109 51 34	2469	108 9 37	2463	106 27 32	2457	104 45 19	2453
	SUN E.	131 28 58	2750	129 53 25	2743	128 17 42	2736	126 41 50	2730
25	Saturn W.	77 0 53	2337	78 45 59	2332	80 31 12	2328	82 16 31	2324
	α Arietis W.	59 8 38	2560	60 48 28	2548	62 28 34	2539	64 8 53	2529
	Aldebaran W.	25 50 59	2361	27 35 30	2355	29 20 9	2351	31 4 54	2347
	Regulus E.	54 19 27	2358	52 34 52	2354	50 50 11	2350	49 5 24	2346
	Jupiter E.	96 12 31	2429	94 29 38	2424	92 46 38	2421	91 3 33	2417
	SUN E.	118 40 32	2702	117 3 54	2697	115 27 10	2692	113 50 19	2687
26	Saturn W.	91 4 26	2306	92 50 17	2303	94 36 12	2300	96 22 11	2297
	α Arietis W.	72 33 31	2491	74 14 57	2485	75 56 31	2479	77 38 14	2474
	Aldebaran W.	39 50 5	2328	41 35 23	2325	43 20 46	2322	45 6 14	2319
	Regulus E.	40 20 10	2328	38 34 52	2325	36 49 29	2323	35 4 3	2320
	Jupiter E.	82 26 44	2398	80 43 7	2396	78 59 26	2391	77 15 39	2389
	SUN E.	105 44 34	2666	104 7 9	2663	102 29 39	2659	100 52 4	2655
27	Saturn W.	105 13 13	2283	106 59 37	2281	108 46 4	2279	110 32 35	2277
	α Arietis W.	86 8 24	2455	87 50 41	2451	89 33 3	2450	91 15 27	2447
	Aldebaran W.	53 54 38	2304	55 40 31	2302	57 26 28	2300	59 12 28	2298
	Regulus E.	26 15 49	2308	24 30 1	2305	22 44 9	2304	20 58 15	2302
	Jupiter E.	68 35 47	2375	66 51 37	2373	65 7 24	2371	63 23 8	2369
	SUN E.	92 43 2	2640	91 5 1	2638	89 26 58	2635	87 48 50	2633
28	Aldebaran W.	68 3 15	2288	69 49 32	2287	71 35 51	2285	73 22 13	2284
	Pollux W.	25 10 46	2539	26 51 5	2508	28 32 7	2483	30 13 44	2461
	Jupiter E.	54 41 8	2362	52 56 38	2360	51 12 6	2359	49 27 33	2359
	SUN E.	79 37 32	2623	77 59 9	2622	76 20 44	2621	74 42 18	2620
29	Aldebaran W.	82 14 22	2281	84 0 50	2280	85 47 19	2281	87	
	Pollux W.	38 47 59	2395	40 31 41	2386	42 15 36	2380		
	Jupiter E.	40 44 44	2360	39 0 11	2361	37 15 40	2361		
	SUN E.	66 29 53	2618	64 51 23	2619	63 12 54	261		
30	Aldebaran W.	96 26 0	2285	98 12 22	2286	99 58 42	22		
	Pollux W.	52 41 47	2355	54 26 26	2354	56 11 7	23		
	Regulus W.	16 18 54	2292	18 5 5	2292	19 51 16	2		
	Jupiter E.	26 49 48	2383	25 5 49	2391	23 22 1			
	SUN E.	53 22 31	2629	51 44 16	2633	50 6 6			
31	Pollux W.	66 39 14	2358	68 23 49	2360	70 8 2			
	Regulus W.	30 27 35	2307	32 13 24	2310	33 59			
	SUN E.	40 19 2	2666	38 41 37	2674	37 4 1			



## CONFIGURATIONS OF THE SATELLITES OF JUPITER

At 17<sup>h</sup> 30<sup>m</sup>, MEAN TIME.

Day of the Month.	West.	East.
-------------------------	-------	-------

The SATELLITES are not visible until the 21st day of this Month,  
JUPITER being too near to the SUN.

21		3 <sup>•</sup>	4 <sup>•</sup> .1	○	2 <sup>•</sup>
22		3 <sup>•</sup> 4 <sup>•</sup>		1 ○	
23		4 <sup>•</sup>	2 <sup>•</sup> 3 <sup>•</sup>	○ .1	
24		4 <sup>•</sup>		1 <sup>•</sup> ○	2 <sup>•</sup> 3 <sup>•</sup>
25		4 <sup>•</sup>		○	.1 2 <sup>•</sup> 3 <sup>•</sup>
26		4 <sup>•</sup>	2 <sup>•</sup> .1	○	3 <sup>•</sup>
27		4 <sup>•</sup>	2 <sup>•</sup>	○ 2 <sup>•</sup> 1 <sup>•</sup>	
28			3 <sup>•</sup> 4 <sup>•</sup> .1	○	2 <sup>•</sup>
29		3 <sup>•</sup>		○ 2 <sup>•</sup> 1 <sup>•</sup>	
30	.1 ●	3 <sup>•</sup> 2 <sup>•</sup>		○	4 <sup>•</sup>
31			1 <sup>•</sup> ○	2 <sup>•</sup> 3 <sup>•</sup>	4 <sup>•</sup>

This Table represents, at 17<sup>h</sup> 30<sup>m</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the configurations; the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to designate the Satellites from each other; and their positions are such as to indicate the directions of their motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A white circle (○) at the left or right hand of the page, denotes that the Satellite is placed by the side of the disc of Jupiter, and a black circle (●) that it is either *behind* the disc, or in the shadow of Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.\*

SATELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.	21	<sup>h</sup> 20 <sup>m</sup> 10 <sup>s</sup> 0.4	<sup>h</sup> 10 <sup>m</sup> 11 <sup>s</sup> 37.0	Im.
	23	14 38 33.8	4 47 9.0	Im.
	25	9 6 59.2	23 22 33.1	Im.
	27	3 35 32.7	17 58 5.2	Im.
	28	22 3 59.6	12 33 30.7	Im.
	30†	16 32 32.1	7 9 1.9	Im.
II.	24	9 57 29.7	0 9 15.3	Im.
	27	23 14 9.8	13 39 55.9	Im.
	31	12 30 48.8	3 10 35.5	Im.
III.	24	6 13 9.1	20 24 17.8	Im.
	31	10 11 22.3	0 50 46.1	Im.

\* The Satellites are not visible until the 21st day of  
Jupiter being too near to the Sun.



**APPROXIMATE SIDEREAL TIMES 1909**  
**OF THE**  
**OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER\***  
**AND OF THE**  
**TRANSITS OF THE SATELLITES AND THEIR SHADOWS**  
**OVER THE DISC OF THE PLANET.**

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHADOWS.	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Egress.
	d h m	d h m	d h m	d h m	d h m	d h m
I.		21 12 51	22* 7 55	22 10 11	22† 7 29	22 9 4
	In	23† 7 28	24 2 32	24 4 48	24 8 4	24 7 4
		25 2 5	26 21 9	26 23 25	26 20 40	26 20 1
	the	27 20 42	28 15 46	28 18 2	28 15 15	28 17 1
	Shadow.	29 15 19	29 10 23	29 12 39	29 9 51	29 12 1
		30 9 56	31 5 0	31† 7 16	31 4 26	31 6 4
II.	In the	24 3 46	22 6 2	22† 8 48	22 5 11	22† 7 1
		28 17 23	26 19 41	26 22 27	26 18 44	26 21 1
	Shadow.	31† 7 0	29† 9 19	29 12 5	29* 8 16	29 11 1
III.	In the	24 1 12	27 12 28	28 15 31	27 10 25	27 13 1
	Shadow.	31 6 4				

\* The Satellites are not visible until the 21st day of this Month,  
 Jupiter being too near to the Sun.

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>h</sup> 62 <sup>m</sup> 57 <sup>s</sup> 3.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	+1.2679	+0.4764	+9.6820	+0.7497	11 18 41.78	192	273	.747
2	1.2667	0.5240	9.6835	0.7496	11 14 45.87	193	274	.750
3	1.2654	0.5668	9.6851	0.7496	11 10 49.96	194	275	.753
4	+1.2640	+0.6057	+9.6866	+0.7496	11 6 54.06	195	276	.756
5	1.2624	0.6413	9.6882	0.7497	11 2 58.15	196	277	.758
6	1.2607	0.6740	9.6897	0.7498	10 59 2.24	197	278	.761
7	+1.2588	+0.7044	+9.6913	+0.7500	10 55 6.34	198	279	.761
8	1.2568	0.7327	9.6929	0.7502	10 51 10.43	199	280	.767
9	1.2547	0.7591	9.6945	0.7505	10 47 14.52	200	281	.769
10	+1.2524	+0.7840	+9.6960	+0.7508	10 43 18.62	201	282	.772
11	1.2500	0.8073	9.6976	0.7511	10 39 22.71	202	283	.775
12	1.2475	0.8294	9.6993	0.7515	10 35 26.81	203	284	.778
13	+1.2448	+0.8503	+9.7009	+0.7519	10 31 30.90	204	285	.780
14	1.2419	0.8701	9.7025	0.7524	10 27 34.99	205	286	.783
15	1.2389	0.8889	9.7041	0.7529	10 23 39.08	206	287	.786
16	+1.2357	+0.9068	+9.7058	+0.7534	10 19 43.18	207	288	.789
17	1.2324	0.9239	9.7074	0.7539	10 15 47.27	208	289	.791
18	1.2289	0.9403	9.7091	0.7545	10 11 51.36	209	290	.794
19	+1.2253	+0.9559	+9.7108	+0.7551	10 7 55.46	210	291	.797
20	1.2215	0.9709	9.7125	0.7558	10 3 59.55	211	292	.799
21	1.2175	0.9852	9.7142	0.7565	10 0 3.64	212	293	.802
22	+1.2134	+0.9990	+9.7159	+0.7572	9 56 7.73	213	294	.805
23	1.2091	1.0122	9.7177	0.7579	9 52 11.83	214	295	.808
24	1.2046	1.0249	9.7194	0.7587	9 48 15.92	215	296	.810
25	+1.1999	+1.0371	+9.7212	+0.7595	9 44 20.01	216	297	.813
26	1.1950	1.0489	9.7230	0.7603	9 40 24.10			
27	1.1900	1.0603	9.7248	0.7611	9 36 28			
28	+1.1847	+1.0712	+9.7266	+0.7619	9 32			
29	1.1793	1.0817	9.7284	0.7628	9			
30	1.1736	1.0919	9.7303	0.7636	9			
31	1.1677	1.1017	9.7322	0.7645	9			
32	+1.1616	+1.1112	+9.7341	+0.7654	9 16			



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Frid.	1	14 25 21.33	9.818	S. 14 25 11.1	47.90	1 6.87	16 15.87	0.8
Sat.	2	14 29 16.97	9.852	14 44 20.8	47.31	1 6.98	16 16.79	0.8
Sun.	3	14 33 13.43	9.886	15 3 16.3	46.70	1 7.10	16 16.89	0.8
Mon.	4	14 37 10.70	9.920	15 21 57.0	46.06	1 7.22	16 16.17	0.8
Tues.	5	14 41 8.79	9.955	15 40 22.5	45.42	1 7.34	16 14.63	0.8
Wed.	6	14 45 7.71	9.990	15 58 32.5	44.75	1 7.45	16 12.27	0.8
Thur.	7	14 49 7.46	10.025	16 16 26.4	44.06	1 7.57	16 9.08	0.8
Frid.	8	14 53 8.05	10.059	16 34 3.9	43.36	1 7.69	16 5.06	0.8
Sat.	9	14 57 9.47	10.094	16 51 24.6	42.64	1 7.81	16 0.21	0.8
Sun.	10	15 1 11.72	10.128	17 8 28.0	41.91	1 7.93	15 54.53	0.8
Mon.	11	15 5 14.80	10.163	17 25 13.8	41.15	1 8.05	15 48.02	0.8
Tues.	12	15 9 18.72	10.198	17 41 41.5	40.38	1 8.17	15 40.68	0.8
Wed.	13	15 13 23.47	10.232	17 57 50.6	39.59	1 8.29	15 32.51	0.8
Thur.	14	15 17 29.04	10.267	18 13 40.8	38.79	1 8.41	15 23.52	0.8
Frid.	15	15 21 35.45	10.302	18 29 11.7	37.97	1 8.53	15 13.69	0.8
Sat.	16	15 25 42.69	10.336	18 44 23.0	37.14	1 8.65	15 3.04	0.8
Sun.	17	15 29 50.75	10.371	18 59 14.3	36.29	1 8.76	14 51.56	0.8
Mon.	18	15 33 59.65	10.405	19 13 45.2	35.42	1 8.88	14 39.25	0.8
Tues.	19	15 38 9.38	10.440	19 27 55.3	34.54	1 8.99	14 26.12	0.8
Wed.	20	15 42 19.93	10.474	19 41 44.3	33.65	1 9.11	14 12.16	0.8
Thur.	21	15 46 31.30	10.508	19 55 11.8	32.73	1 9.22	13 57.38	0.8
Frid.	22	15 50 43.48	10.541	20 8 17.4	31.81	1 9.33	13 41.80	0.8
Sat.	23	15 54 56.46	10.574	20 21 0.9	30.87	1 9.44	13 25.42	0.8
Sun.	24	15 59 10.24	10.607	20 33 21.9	29.92	1 9.55	13 8.24	0.8
Mon.	25	16 3 24.81	10.639	20 45 20.0	28.95	1 9.65	12 50.28	0.8
Tues.	26	16 7 40.15	10.671	20 56 54.9	27.98	1 9.75	12 31.55	0.8
Wed.	27	16 11 56.25	10.702	21 8 6.4	26.98	1 9.84	12 12.06	0.8
Thur.	28	16 16 13.10	10.732	21 18 54.0	25.98	1 9.94	11 51.82	0.8
Frid.	29	16 20 30.67	10.762	21 29 17.5	24.96	1 10.03	11 30.86	0.8
Sat.	30	16 24 48.95	10.790	21 39 16.5	23.93	1 10.12	11 9.20	0.8
Sun.	31	16 29 7.91		S. 21 48 50.7		1 10.21	10 46.86	

\* Mean Time of the Semidiameter passing may be found by subtracting 0.19 from the Sidereal Time.

## AT MEAN NOON.

Day of the Month.	Day of the Month.	THE SUN'S			Equation of Time, to be added to Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>
rid.	1	14 25 23.99	S. 14 25 24.1	16 8.8	16 15.88	14 41 39.88
at.	2	14 29 19.64	14 44 33.7	16 9.1	16 16.79	14 45 36.43
n.	3	14 33 16.11	15 3 29.0	16 9.3	16 16.88	14 49 32.98
on.	4	14 37 13.39	15 22 9.5	16 9.5	16 16.13	14 53 29.54
ues.	5	14 41 11.49	15 40 34.8	16 9.8	16 14.60	14 57 26.09
ed.	6	14 45 10.41	15 58 44.6	16 10.0	16 12.23	15 1 22.65
hur.	7	14 49 10.16	16 16 38.3	16 10.3	16 9.04	15 5 19.20
rid.	8	14 53 10.75	16 34 15.6	16 10.5	16 5.01	15 9 15.76
at.	9	14 57 12.16	16 51 36.0	16 10.7	16 0.15	15 13 12.31
n.	10	15 1 14.41	17 8 39.2	16 11.0	15 54.46	15 17 8.87
on.	11	15 5 17.48	17 25 24.6	16 11.2	15 47.94	15 21 5.42
ues.	12	15 9 21.39	17 41 52.0	16 11.4	15 40.59	15 25 1.98
ed.	13	15 13 26.12	17 58 0.8	16 11.6	15 32.41	15 28 58.53
hur.	14	15 17 31.68	18 13 50.7	16 11.9	15 23.41	15 32 55.09
rid.	15	15 21 38.06	18 29 21.4	16 12.1	15 13.58	15 36 51.64
at.	16	15 25 45.28	18 44 32.4	16 12.3	15 2.92	15 40 48.20
n.	17	15 29 53.32	18 59 23.3	16 12.5	14 51.43	15 44 44.75
on.	18	15 34 2.19	19 13 53.8	16 12.7	14 39.12	15 48 41.31
ues.	19	15 38 11.89	19 28 3.6	16 12.9	14 25.98	15 52 37.87
ed.	20	15 42 22.41	19 41 52.2	16 13.1	14 12.01	15 56 34.42
hur.	21	15 46 33.74	19 55 19.4	16 13.3	13 57.23	16 0 30.98
rid.	22	15 50 45.88	20 8 24.7	16 13.5	13 41.65	16 4 27.53
at.	23	15 54 58.83	20 21 7.8	16 13.6	13 25.26	16 8 24.09
un.	24	15 59 12.57	20 33 28.4	16 13.8	13 8.08	16 12 20.65
on.	25	16 3 27.09	20 45 26.2	16 14.0	12 50.12	16 16 17.71
ues.	26	16 7 42.38	20 57 0.8	16 14.1	12 31.38	16 20 14.27
ed.	27	16 11 58.43	21 8 11.9	16 14.3	12 11.89	16 24 10.84
hur.	28	16 16 15.22	21 18 59.1	16 14.4	11 51.63	16 28 7.41
rid.	29	16 20 32.74	21 29 22.2	16 14.6	11 30.69	16 31 4.08
at.	30	16 24 50.96	21 39 20.9	16 14.8	11 9.03	16 34 50.75
un.	31	16 29 9.85	S. 21 48 54.8	16 14.9	11 0.69	16 38 47.42

\* The Semidiameter for Apparent Noon may be assumed the same as for Mean.



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax.	
	Noon.	Noon.		Noon.	Midnight.	[ Noon.	Midnight.
1	218 44 13.2	N. 0.44	9.9964367	16 2.1	15 59.3	58 50.5	58 40.1
2	219 41 22.0	0.51	9.9963280	15 56.0	15 52.2	58 28.2	58 14.1
3	220 44 32.9	0.55	9.9962197	15 48.0	15 43.5	57 59.0	57 42.7
4	221 44 45.5	0.56	9.9961120	15 38.6	15 33.5	57 24.4	57 3.7
5	222 44 59.9	0.55	9.9960048	15 28.3	15 23.0	56 46.5	56 26.7
6	223 45 16.0	0.50	9.9958981	15 17.7	15 12.6	56 7.5	55 48.1
7	224 45 33.7	0.42	9.9957921	15 7.7	15 3.1	55 30.9	55 14.1
8	225 45 53.1	0.32	9.9956868	14 58.9	14 55.2	54 58.8	54 43.3
9	226 46 14.0	0.21	9.9955823	14 52.1	14 49.5	54 33.6	54 21.3
10	227 46 36.3	N. 0.08	9.9954789	14 47.6	14 46.4	54 17.4	54 13.9
11	228 47 0.1	S. 0.05	9.9953767	14 46.0	14 46.2	54 11.3	54 12.1
12	229 47 25.2	0.18	9.9952758	14 47.2	14 48.9	54 15.7	54 21.7
13	230 47 51.6	0.30	9.9951762	14 51.3	14 54.3	54 30.7	54 41.9
14	231 48 19.3	0.41	9.9950782	14 58.0	15 2.3	54 55.4	55 11.1
15	232 48 48.3	0.50	9.9949820	15 7.1	15 12.3	55 28.7	55 47.7
16	233 49 18.7	0.56	9.9948877	15 17.8	15 23.5	56 7.9	56 29.1
17	234 49 50.4	0.58	9.9947953	15 29.4	15 35.3	56 50.7	57 12.4
18	235 50 23.6	0.58	9.9947050	15 41.2	15 46.8	57 33.8	57 54.4
19	236 50 58.2	0.55	9.9946168	15 52.1	15 57.0	58 13.9	58 31.4
20	237 51 34.3	0.49	9.9945310	16 1.4	16 5.2	58 47.9	59 2.4
21	238 52 11.9	0.41	9.9944475	16 8.4	16 10.9	59 13.7	59 22.9
22	239 52 50.9	0.30	9.9943662	16 12.7	16 13.8	59 29.5	59 33.6
23	240 53 31.5	0.18	9.9942869	16 14.3	16 14.1	59 35.3	59 34.7
24	241 54 13.7	S. 0.05	9.9942097	16 13.4	16 12.3	59 32.3	59 28.8
25	242 54 57.4	N. 0.09	9.9941346	16 10.7	16 8.7	59 22.1	59 14.8
26	243 55 42.7	0.21	9.9940614	16 6.4	16 3.9	59 6.4	58 57.1
27	244 56 29.6	0.33	9.9939899	16 1.1	15 58.2	58 47.0	58 36.7
28	245 57 18.1	0.43	9.9939202	15 55.1	15 51.9	58 25.0	58 13.1
29	246 58 8.0	0.51	9.9938521	15 48.5	15 45.0	58 0.8	57 48.0
30	247 58 59.3	0.56	9.9937857	15 41.4	15 37.6	57 31.6	57 20.8
31	248 59 52.0	N. 0.58	9.9937207	15 33.7	15 29.7	57 6.4	56 51.7

## MEAN TIME.

		THE MOON'S									
Day of the Week.	Day of the Month.	Longitude.			Latitude.			Age.		Meridian	
		Noon.		Midnight.	Noon.		Midnight.	Noon.	Passage.		
		° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	d	h	m	
rid.	1	185 6 57.0	192 8 47.7	N. 4 5 39.0	N. 4 25 3.2	26.9	22 29.1				
t.	2	199 8 37.9	206 5 54.2	4 40 21.0	4 51 21.8	27.9	23 19.1				
n.	3	213 0 3.8	219 50 35.6	4 58 0.4	5 0 16.7	28.9	♂				
on.	4	226 37 1.4	233 18 57.7	4 58 16.3	4 52 8.7	0.4	0 9.2				
es.	5	239 56 6.8	246 28 16.9	4 42 7.6	4 28 28.9	1.4	0 59.7				
ed.	6	252 55 23.1	259 17 27.6	4 11 31.8	3 51 36.8	2.4	1 50.6				
ur.	7	265 34 38.6	271 47 11.5	3 29 5.0	3 4 17.5	3.4	2 41.4				
id.	8	277 55 27.1	283 59 51.5	2 37 35.7	2 9 20.5	4.4	3 31.7				
t.	9	290 0 55.0	295 59 11.9	1 39 51.4	1 9 27.9	5.4	4 20.9				
n.	10	301 55 19.6	307 49 57.1	N. 0 38 28.3	N. 0 7 10.7	6.4	5 8.8				
on.	11	313 43 45.7	319 37 27.1	S. 0 24 8.3	S. 0 55 11.6	7.4	5 55.1				
es.	12	325 31 43.8	331 27 17.6	1 25 42.1	1 55 23.3	8.4	6 40.2				
ed.	13	337 24 49.6	343 24 59.2	2 23 57.9	2 51 8.6	9.4	7 24.2				
ur.	14	349 28 23.5	355 35 36.6	3 16 37.1	3 40 5.0	10.4	8 7.9				
id.	15	1 47 8.7	8 3 25.4	4 1 13.3	4 19 42.6	11.4	8 52.0				
t.	16	14 24 46.4	20 51 25.8	4 35 13.6	4 47 27.4	12.4	9 37.1				
n.	17	27 23 30.1	34 0 59.2	4 56 6.5	5 0 54.5	13.4	10 24.1				
on.	18	40 43 45.0	47 31 32.1	5 1 37.7	4 58 6.4	14.4	11 13.7				
es.	19	54 23 58.5	61 20 35.7	4 50 14.2	4 38 0.1	15.4	12 6.4				
ed.	20	68 20 50.7	75 24 6.7	4 21 28.3	4 0 48.9	16.4	13 2.3				
ur.	21	82 29 45.1	89 37 7.3	3 36 17.6	3 8 15.9	17.4	14 0.7				
id.	22	96 45 35.6	103 54 35.2	2 37 9.9	2 3 30.7	18.4	15 0.3				
t.	23	111 3 35.0	118 12 8.3	1 27 52.0	S. 0 50 49.8	19.4	15 59.5				
n.	24	125 19 53.4	132 26 33.1	S. 0 13 1.6	N. 0 24 54.7	20	17.0				
on.	25	139 31 54.1	146 35 47.1	N. 1 2 22.1	1 38						
es.	26	153 38 5.4	160 38 44.2	2 13 29.1	2						
ed.	27	167 37 39.2	174 34 46.5	3 16 0.5	3						
ur.	28	181 30 1.4	188 23 17.9	4 6 22.9							
id.	29	195 14 28.7	202 3 24.5	4 41 58.3							
t.	30	208 49 54.6	215 33 46.7	5 1 11.3							
n.	31	222 14 47.9	228 52 44.8	N. 5 3 30.6							



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 1.				SUNDAY 3.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	12 25 16.53	N. 1 43 27.7	123.03	0	14 9 59.43	S. 7 50 57.8	11
1	12 27 28.38	1 31 9.5	123.07	1	14 12 10.11	8 2 7.7	11
2	12 29 40.15	1 18 51.1	123.10	2	14 14 20.81	8 13 14.5	11
3	12 31 51.86	1 6 32.5	123.12	3	14 16 31.54	8 24 18.2	11
4	12 34 3.49	0 54 13.8	123.12	4	14 18 42.28	8 35 18.7	10
5	12 36 15.06	0 41 55.1	123.12	5	14 20 53.05	8 46 16.0	10
6	12 38 26.56	0 29 36.4	123.10	6	14 23 3.84	8 57 9.9	10
7	12 40 37.99	0 17 17.8	123.05	7	14 25 14.66	9 8 0.5	10
8	12 42 49.37	N. 0 4 59.5	123.02	8	14 27 25.50	9 18 47.7	10
9	12 45 0.69	S. 0 7 18.6	122.97	9	14 29 36.37	9 29 31.4	10
10	12 47 11.95	0 19 36.4	122.88	10	14 31 47.27	9 40 11.6	10
11	12 49 23.15	0 31 53.7	122.82	11	14 33 58.20	9 50 48.2	10
12	12 51 34.31	0 44 10.6	122.72	12	14 36 9.16	10 1 21.1	10
13	12 53 45.42	0 56 26.9	122.62	13	14 38 20.15	10 11 50.3	10
14	12 55 56.48	1 8 42.6	122.48	14	14 40 31.18	10 22 15.7	10
15	12 58 7.50	1 20 57.5	122.37	15	14 42 42.23	10 32 37.3	10
16	13 0 18.47	1 33 11.7	122.23	16	14 44 53.32	10 42 55.1	10
17	13 2 29.40	1 45 25.1	122.07	17	14 47 4.45	10 53 8.9	10
18	13 4 40.30	1 57 37.5	121.90	18	14 49 15.61	11 3 18.7	10
19	13 6 51.16	2 9 48.9	121.73	19	14 51 26.80	11 13 24.5	10
20	13 9 1.98	2 21 59.3	121.53	20	14 53 38.03	11 23 26.1	9
21	13 11 12.77	2 34 8.5	121.33	21	14 55 49.30	11 33 23.7	9
22	13 13 23.54	2 46 16.5	121.13	22	14 58 0.61	11 43 17.0	9
23	13 15 34.27	S. 2 58 23.3	120.90	23	15 0 11.95	S. 11 53 6.1	9
SATURDAY 2.				MONDAY 4.			
0	13 17 44.98	S. 3 10 28.7	120.67	0	15 2 23.33	S. 12 2 50.9	9
1	13 19 55.67	3 22 32.7	120.42	1	15 4 34.75	12 12 31.4	9
2	13 22 6.33	3 34 35.2	120.15	2	15 6 46.21	12 22 7.4	9
3	13 24 16.98	3 46 36.1	119.88	3	15 8 57.70	12 31 39.0	9
4	13 26 27.60	3 58 35.4	119.60	4	15 11 9.24	12 41 6.1	9
5	13 28 38.22	4 10 33.0	119.32	5	15 13 20.81	12 50 28.7	9
6	13 30 48.82	4 22 28.9	119.02	6	15 15 32.42	12 59 46.7	9
7	13 32 59.40	4 34 23.0	118.68	7	15 17 44.08	13 9 0.0	9
8	13 35 9.98	4 46 15.1	118.37	8	15 19 55.77	13 18 8.6	9
9	13 37 20.55	4 58 5.3	118.03	9	15 22 7.50	13 27 12.6	9
10	13 39 31.12	5 9 53.5	117.68	10	15 24 19.27	13 36 11.7	9
11	13 41 41.68	5 21 39.6	117.33	11	15 26 31.08	13 45 6.0	9
12	13 43 52.25	5 33 23.6	116.95	12	15 28 42.93	13 53 55.5	9
13	13 46 2.81	5 45 5.3	116.55	13	15 30 54.82	14 2 40.0	9
14	13 48 13.37	5 56 44.6	116.17	14	15 33 6.75	14 11 19.6	9
15	13 50 23.94	6 8 21.6	115.77	15	15 35 18.71	14 19 54.3	9
16	13 52 34.51	6 19 56.2	115.35	16	15 37 30.71	14 28 23.8	9
17	13 54 45.09	6 31 28.3	114.93	17	15 39 42.76	14 36 48.3	9
18	13 56 55.67	6 42 57.9	114.48	18	15 41 54.84	14 45 7.7	9
19	13 59 6.27	6 54 24.8	114.03	19	15 44 6.95	14 53 22.0	9
20	14 1 16.87	7 5 49.0	113.58	20	15 46 19.10	15 1 31.0	9
21	14 3 27.49	7 17 10.5	113.10	21	15 48 31.29	15 9 34.8	9
22	14 5 38.12	7 28 29.1	112.63	22	15 50 43.51	15 17 33.4	9
23	14 7 48.77	7 39 44.9	112.15	23	15 52 55.76	15 25 26.7	9
24	14 9 59.43	S. 7 50 57.8		24	15 55 8.05	S. 15 33 14.6	9



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
TUESDAY 5.				THURSDAY 7.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	15 55 8.05	S. 15 33 14.6	77.10	0	17 41 13.11	S. 19 54 1.1	29.42
1	15 57 20.37	15 40 57.2	76.18	1	17 43 25.37	19 56 57.6	28.37
2	15 59 32.72	15 48 34.3	75.28	2	17 45 37.59	19 59 47.8	27.32
3	16 1 45.10	15 56 6.0	74.37	3	17 47 49.75	20 2 31.7	26.28
4	16 3 57.52	16 3 32.2	73.45	4	17 50 1.87	20 5 9.4	25.23
5	16 6 9.96	16 10 52.9	72.53	5	17 52 13.93	20 7 40.8	24.20
6	16 8 22.42	16 18 8.1	71.60	6	17 54 25.94	20 10 6.0	23.15
7	16 10 34.92	16 25 17.7	70.68	7	17 56 37.89	20 12 24.9	22.10
8	16 12 47.44	16 32 21.8	69.72	8	17 58 49.79	20 14 37.5	21.07
9	16 14 59.99	16 39 20.1	68.80	9	18 1 1.62	20 16 43.9	20.03
10	16 17 12.56	16 46 12.9	67.83	10	18 3 13.39	20 18 44.1	18.98
11	16 19 25.15	16 52 59.9	66.88	11	18 5 25.10	20 20 38.0	17.93
12	16 21 37.77	16 59 41.2	65.93	12	18 7 36.73	20 22 25.6	16.90
13	16 23 50.41	17 6 16.8	64.97	13	18 9 48.30	20 24 7.0	15.87
14	16 26 3.06	17 12 46.6	63.98	14	18 11 59.80	20 25 42.2	14.82
15	16 28 15.73	17 19 10.5	63.03	15	18 14 11.23	20 27 11.1	13.78
16	16 30 28.42	17 25 28.7	62.05	16	18 16 22.58	20 28 33.8	12.75
17	16 32 41.13	17 31 41.0	61.08	17	18 18 33.86	20 29 50.3	11.72
18	16 34 53.84	17 37 47.5	60.08	18	18 20 45.05	20 31 0.6	10.68
19	16 37 6.57	17 43 48.0	59.12	19	18 22 56.17	20 32 4.7	9.67
20	16 39 19.31	17 49 42.7	58.12	20	18 25 7.20	20 33 2.7	8.62
21	16 41 32.05	17 55 31.4	57.12	21	18 27 18.14	20 34 54.4	7.58
22	16 43 44.81	18 1 14.1	56.13	22	18 29 29.00	20 36 39.9	6.57
23	16 45 57.57	S. 18 6 50.9	55.12	23	18 31 39.78	S. 20 35 19.3	5.55
WEDNESDAY 6.				FRIDAY 8.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	16 48 10.32	S. 18 12 21.6	54.12	0	18 33 50.46	S. 20 35 52.6	4.52
1	16 50 23.09	18 17 46.3	53.12	1	18 36 1.03	20 36 19.7	3.50
2	16 52 35.85	18 23 5.0	52.12	2	18 38 11.55	20 36 40.7	2.47
3	16 54 48.62	18 28 17.7	51.08	3	18 40 21.95	20 36 55.5	1.47
4	16 57 1.38	18 33 24.2	50.08	4	18 42 32.25	20 37 4.3	0.45
5	16 59 14.14	18 38 24.7	49.07	5	18 44 42.45	20 37 7.0	0.57
6	17 1 26.89	18 43 19.1	48.03	6	18 46 52.55	20 37 3.6	1.58
7	17 3 39.63	18 48 7.3	47.03	7	18 49 2.55	20 36 54.1	2.58
8	17 5 52.37	18 52 49.5	46.98	8	18 51 12.45	20 36 38.6	3.58
9	17 8 5.09	18 57 25.4	44.98	9	18 53 22.23	20 36 17.1	4.58
10	17 10 17.79	19 1 55.3	43.93	10	18 55 31.91	20 35 49.6	5.60
11	17 12 30.48	19 6 18.9	42.92	11	18 57 41.48	20 35 16.0	6.67
12	17 14 43.15	19 10 36.4	41.88	12	18 59 50.94	20 34 36.5	
13	17 16 55.80	19 14 47.7	40.85	13	19 2 0.29	20 33 51.0	
14	17 19 8.44	19 18 52.8	39.80	14	19 4 9.52	20 32 59	
15	17 21 21.04	19 22 51.6	38.78	15	19 6 18.63	20 32	
16	17 23 33.62	19 26 44.3	37.75	16	19 8 27.63	20 30	
17	17 25 46.18	19 30 30.8	36.70	17	19 10 36.50	20 29	
18	17 27 58.70	19 34 11.0	35.65	18	19 12 45.26	20 27	
19	17 30 11.20	19 37 44.9	34.63	19	19 14 53.90	20 25	
20	17 32 23.65	19 41 12.7	33.58	20	19 17 2.41	20 23	
21	17 34 36.08	19 44 34.2	32.53	21	19 19 10.81	20 21	
22	17 36 48.46	19 47 49.4	31.50	22	19 21 19.07	20 19	
23	17 39 0.81	19 50 58.4	30.45	23	19 23 27.21	20 17	
24	17 41 13.11	S. 19 54 1.1		24	19 25 35.22	S. 20 15	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10".	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10".
SATURDAY 9.				MONDAY 11.			
0	19 25 35.22	S. 20 19 2.4	19.27	0	21 5 16.94	S. 17 6 8.4	60.72
1	19 27 43.10	20 17 6.8	20.22	1	21 7 18.11	17 0 6.7	61.03
2	19 29 50.86	20 15 5.5	21.17	2	21 9 19.16	16 54 0.5	61.77
3	19 31 58.48	20 12 58.5	22.10	3	21 11 20.06	16 47 49.9	62.90
4	19 34 5.97	20 10 45.9	23.07	4	21 13 20.84	16 41 34.9	63.22
5	19 36 13.33	20 8 27.5	23.98	5	21 15 21.49	16 35 15.5	63.95
6	19 38 20.55	20 6 3.6	24.92	6	21 17 22.00	16 28 51.8	64.57
7	19 40 27.64	20 3 34.1	25.85	7	21 19 22.39	16 22 23.8	65.10
8	19 42 34.60	20 0 59.0	26.78	8	21 21 22.65	16 15 51.4	66.10
9	19 44 41.41	19 58 18.3	27.70	9	21 23 22.78	16 9 14.8	66.94
10	19 46 48.09	19 55 32.1	28.62	10	21 25 22.79	16 2 34.0	67.91
11	19 48 54.64	19 52 40.4	29.53	11	21 27 22.67	15 55 48.9	68.70
12	19 51 1.04	19 49 43.2	30.43	12	21 29 22.43	15 48 59.7	69.90
13	19 53 7.31	19 46 40.6	31.35	13	21 31 22.08	15 42 6.3	69.90
14	19 55 13.43	19 43 32.5	32.25	14	21 33 21.60	15 35 8.8	70.27
15	19 57 19.12	19 40 19.0	33.15	15	21 35 21.00	15 28 7.2	70.90
16	19 59 25.27	19 37 0.1	34.05	16	21 37 20.28	15 21 1.6	71.40
17	20 1 30.97	19 33 35.8	34.92	17	21 39 19.45	15 13 51.9	72.20
18	20 3 36.54	19 30 6.3	35.82	18	21 41 18.50	15 6 38.2	72.90
19	20 5 41.96	19 26 31.4	36.70	19	21 43 17.44	14 59 20.5	73.40
20	20 7 47.23	19 22 51.2	37.58	20	21 45 16.27	14 51 58.9	74.20
21	20 9 52.37	19 19 5.7	38.43	21	21 47 14.99	14 44 33.4	74.90
22	20 11 57.36	19 15 15.1	39.32	22	21 49 13.60	14 37 4.0	75.50
23	20 14 2.21	S. 19 11 19.2	40.18	23	21 51 12.10	S. 14 29 30.8	76.10
SUNDAY 10.				TUESDAY 12.			
0	20 16 6.91	S. 19 7 18.1	41.03	0	21 53 10.50	S. 14 21 53.7	76.90
1	20 18 11.47	19 3 11.9	41.90	1	21 55 8.79	14 14 12.8	77.40
2	20 20 15.88	18 59 0.5	42.75	2	21 57 6.98	14 6 28.2	78.00
3	20 22 20.16	18 54 44.0	43.58	3	21 59 5.08	13 58 39.9	78.40
4	20 24 24.28	18 50 22.5	44.43	4	22 1 3.07	13 50 47.8	79.20
5	20 26 28.27	18 45 55.9	45.27	5	22 3 0.97	13 42 52.1	79.90
6	20 28 32.10	18 41 24.3	46.10	6	22 4 58.77	13 34 52.7	80.20
7	20 30 35.80	18 36 47.7	46.93	7	22 6 56.48	13 26 49.7	81.10
8	20 32 39.35	18 32 6.1	47.75	8	22 8 54.10	13 18 43.0	81.60
9	20 34 42.76	18 27 19.6	48.57	9	22 10 51.63	13 10 32.9	82.20
10	20 36 46.02	18 22 28.2	49.38	10	22 12 49.07	13 2 19.2	82.90
11	20 38 49.14	18 17 31.9	50.20	11	22 14 46.43	12 54 2.0	83.40
12	20 40 52.12	18 12 30.7	51.00	12	22 16 43.70	12 45 41.3	84.10
13	20 42 54.96	18 7 24.7	51.80	13	22 18 40.89	12 37 17.2	84.40
14	20 44 57.65	18 2 13.9	52.58	14	22 20 38.01	12 28 49.6	85.10
15	20 47 0.21	17 56 58.4	53.38	15	22 22 35.05	12 20 18.7	85.70
16	20 49 2.63	17 51 38.1	54.17	16	22 24 32.01	12 11 44.4	86.10
17	20 51 4.90	17 46 13.1	54.95	17	22 26 28.90	12 3 6.8	86.70
18	20 53 7.04	17 40 43.4	55.72	18	22 28 25.72	11 54 25.9	87.10
19	20 55 9.03	17 35 9.1	56.50	19	22 30 22.47	11 45 41.8	87.70
20	20 57 10.88	17 29 30.1	57.27	20	22 32 19.16	11 36 54.4	88.40
21	20 59 12.60	17 23 46.5	58.02	21	22 34 15.78	11 28 3.8	88.90
22	21 1 14.18	17 17 58.4	58.78	22	22 36 12.34	11 19 10.0	89.40
23	21 3 15.63	17 12 5.7	59.55	23	22 38 8.84	11 10 13.1	90.00
24	21 5 16.94	S. 17 6 8.4		24	22 40 5.28	S. 11 1 13.1	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10".	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10".
WEDNESDAY 13.				FRIDAY 15.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	22 40 5.28	S. 11 1 13.1	90.52	0	0 12 57.36	S. 2 58 38.8	108.75
1	22 42 1.67	10 52 10.0	91.02	1	0 14 54.21	2 47 46.3	108.97
2	22 43 58.01	10 43 3.9	91.53	2	0 16 51.15	2 36 52.5	109.22
3	22 45 54.29	10 33 54.7	92.03	3	0 18 48.16	2 25 57.2	109.42
4	22 47 50.53	10 24 42.5	92.52	4	0 20 45.26	2 15 0.7	109.63
5	22 49 46.73	10 15 27.4	93.00	5	0 22 42.45	2 4 2.9	109.85
6	22 51 42.88	10 6 9.4	93.48	6	0 24 39.73	1 53 3.8	110.03
7	22 53 38.99	9 56 48.5	93.98	7	0 26 37.11	1 42 3.6	110.23
8	22 55 35.06	9 47 24.6	94.43	8	0 28 34.59	1 31 2.2	110.40
9	22 57 31.10	9 37 58.0	94.90	9	0 30 32.16	1 19 59.8	110.58
10	22 59 27.10	9 28 28.6	95.37	10	0 32 29.85	1 8 56.3	110.77
11	23 1 23.08	9 18 56.4	95.83	11	0 34 27.64	0 57 51.7	110.92
12	23 3 19.02	9 9 21.4	96.28	12	0 36 25.53	0 46 46.2	111.07
13	23 5 14.94	8 59 43.7	96.72	13	0 38 23.54	0 35 39.8	111.23
14	23 7 10.84	8 50 3.4	97.17	14	0 40 21.67	0 24 32.4	111.35
15	23 9 6.72	8 40 20.4	97.60	15	0 42 19.92	0 13 24.3	111.50
16	23 11 2.58	8 30 34.8	98.03	16	0 44 18.29	S. 0 2 15.3	111.62
17	23 12 58.42	8 20 46.6	98.45	17	0 46 16.79	N. 0 8 54.4	111.73
18	23 14 54.26	8 10 55.9	98.87	18	0 48 15.41	0 20 4.8	111.85
19	23 16 50.08	8 1 2.7	99.30	19	0 50 14.17	0 31 15.9	111.93
20	23 18 45.90	7 51 6.9	99.68	20	0 52 13.07	0 42 27.5	112.03
21	23 20 41.71	7 41 8.8	100.10	21	0 54 12.10	0 53 39.7	112.13
22	23 22 37.52	7 31 8.2	100.50	22	0 56 11.27	1 4 52.5	112.20
23	23 24 33.33	S. 7 21 5.2	100.88	23	0 58 10.59	N. 1 16 5.7	112.27
THURSDAY 14.				SATURDAY 16.			
0	23 26 29.15	S. 7 10 59.9	101.27	0	1 0 10.05	N. 1 27 19.3	112.33
1	23 28 24.97	7 0 52.3	101.65	1	1 2 9.67	1 38 33.3	112.38
2	23 30 20.81	6 50 42.4	102.03	2	1 4 9.44	1 49 47.6	112.43
3	23 32 16.65	6 40 30.2	102.40	3	1 6 9.37	2 1 2.2	112.45
4	23 34 12.52	6 30 15.8	102.75	4	1 8 9.45	2 12 16.9	112.50
5	23 36 8.40	6 19 59.3	103.12	5	1 10 9.70	2 23 31.9	112.50
6	23 38 4.30	6 9 40.6	103.47	6	1 12 10.12	2 34 46.9	112.52
7	23 40 0.22	5 59 19.8	103.82	7	1 14 10.70	2 46 2.0	112.52
8	23 41 56.17	5 48 56.9	104.15	8	1 16 11.46	2 57 17.1	112.52
9	23 43 52.15	5 38 32.0	104.48	9	1 18 12.39	3 8 32.2	112.50
10	23 45 48.16	5 28 5.1	104.82	10	1 20 13.50	3 19 47.2	112.47
11	23 47 44.21	5 17 36.2	105.13	11	1 22 14.79	3 31 2.0	112.42
12	23 49 40.29	5 7 5.4	105.45	12	1 24 16.27	3 42 16.6	
13	23 51 36.42	4 56 32.7	105.75	13	1 26 17.93	3 53 30.6	
14	23 53 32.59	4 45 58.2	106.07	14	1 28 19.78	4 4 44	
15	23 55 28.80	4 35 21.8	106.37	15	1 30 21.82	4 15 58	
16	23 57 25.07	4 24 43.6	106.65	16	1 32 24.06	4 27 11	
17	23 59 21.39	4 14 3.7	106.93	17	1 34 26.50	4 38 24	
18	0 1 17.76	4 3 22.1	107.20	18	1 36 29.14	4 49 36	
19	0 3 14.20	3 52 38.9	107.50	19	1 38 31.98	5 0 48	
20	0 5 10.69	3 41 53.9	107.73	20	1 40 35.03	5 11 5	
21	0 7 7.25	3 31 7.5	108.02	21	1 42 38.30	5 23	
22	0 9 3.88	3 20 19.4	108.27	22	1 44 41.77	5 34 1	
23	0 11 0.58	3 9 29.8	108.50	23	1 46 45.46	5 45 2	
24	0 12 57.36	S. 2 58 38.8		24	1 48 49.38	N. 5 56 3	



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 17.				TUESDAY 19.			
0	1 48 49.38	N. 5 56 34.9	111.12	0	3 33 0.19	N. 14 11 27.1	40.1
1	1 50 53.51	6 7 41.6	110.95	1	3 35 17.45	14 20 27.5	39.1
2	1 52 57.87	6 18 47.3	110.77	2	3 37 35.00	14 29 23.4	38.1
3	1 55 2.45	6 29 51.9	110.58	3	3 39 52.87	14 38 14.8	37.1
4	1 57 7.26	6 40 55.4	110.37	4	3 42 11.03	14 47 1.6	36.1
5	1 59 12.31	6 51 57.6	110.17	5	3 44 29.50	14 55 43.7	35.1
6	2 1 17.58	7 2 58.6	109.93	6	3 46 48.27	15 4 21.0	34.1
7	2 3 23.10	7 13 58.2	109.72	7	3 49 7.34	15 12 53.6	33.1
8	2 5 28.86	7 24 56.5	109.47	8	3 51 26.71	15 21 21.2	32.1
9	2 7 34.86	7 35 53.3	109.20	9	3 53 46.39	15 29 43.8	31.1
10	2 9 41.10	7 46 48.5	108.95	10	3 56 6.36	15 38 1.4	30.1
11	2 11 47.59	7 57 42.2	108.67	11	3 58 26.63	15 46 13.9	29.1
12	2 13 54.33	8 8 34.2	108.38	12	4 0 47.21	15 54 21.1	28.1
13	2 16 1.32	8 19 24.5	108.08	13	4 3 8.08	16 2 23.1	27.1
14	2 18 8.57	8 30 13.0	107.77	14	4 5 29.25	16 10 19.6	26.1
15	2 20 16.08	8 40 59.6	107.45	15	4 7 50.71	16 18 10.8	25.1
16	2 22 23.84	8 51 44.3	107.12	16	4 10 12.47	16 25 56.4	24.1
17	2 24 31.87	9 2 27.0	106.77	17	4 12 34.53	16 33 36.5	23.1
18	2 26 40.16	9 13 7.6	106.42	18	4 14 56.87	16 41 10.9	22.1
19	2 28 48.71	9 23 46.1	106.05	19	4 17 19.50	16 48 39.5	21.1
20	2 30 57.54	9 34 22.4	105.67	20	4 19 42.42	16 56 2.3	20.1
21	2 33 6.63	9 44 56.4	105.27	21	4 22 5.63	17 3 19.3	19.1
22	2 35 15.99	9 55 28.0	104.88	22	4 24 29.12	17 10 30.3	18.1
23	2 37 25.63	N. 10 5 57.3	104.45	23	4 26 52.89	N. 17 17 35.2	69.1
MONDAY 18.				WEDNESDAY 20.			
0	2 39 35.54	N. 10 16 24.0	104.03	0	4 29 16.94	N. 17 24 34.1	68.1
1	2 41 45.73	10 26 48.2	103.58	1	4 31 41.28	17 31 26.8	67.1
2	2 43 56.20	10 37 9.7	103.13	2	4 34 5.89	17 38 13.2	66.1
3	2 46 6.96	10 47 28.5	102.68	3	4 36 30.77	17 44 53.3	65.1
4	2 48 17.99	10 57 44.6	102.20	4	4 38 55.92	17 51 27.1	64.1
5	2 50 29.31	11 7 57.8	101.70	5	4 41 21.34	17 57 54.4	63.1
6	2 52 40.92	11 18 8.0	101.22	6	4 43 47.02	18 4 15.1	62.1
7	2 54 52.81	11 28 15.3	100.70	7	4 46 12.97	18 10 29.3	61.1
8	2 57 5.00	11 38 19.5	100.17	8	4 48 39.17	18 16 36.9	60.1
9	2 59 17.47	11 48 20.5	99.63	9	4 51 5.63	18 22 37.7	59.1
10	3 1 30.24	11 58 18.3	99.08	10	4 53 32.35	18 28 31.7	58.1
11	3 3 43.30	12 8 12.8	98.53	11	4 55 59.31	18 34 18.9	57.1
12	3 5 56.65	12 18 4.0	97.95	12	4 58 26.52	18 39 59.2	56.1
13	3 8 10.30	12 27 51.7	97.37	13	5 0 53.97	18 45 32.5	55.1
14	3 10 24.24	12 37 35.9	96.77	14	5 3 21.66	18 50 58.8	54.1
15	3 12 38.49	12 47 16.5	96.15	15	5 5 49.58	18 56 18.0	53.1
16	3 14 53.04	12 56 53.4	95.52	16	5 8 17.74	19 1 30.1	52.1
17	3 17 7.87	13 6 26.5	94.90	17	5 10 46.12	19 6 34.9	51.1
18	3 19 23.01	13 15 55.9	94.23	18	5 13 14.73	19 11 32.5	50.1
19	3 21 38.45	13 25 21.3	93.57	19	5 15 43.55	19 16 22.7	49.1
20	3 23 54.19	13 34 42.7	92.90	20	5 18 12.59	19 21 5.6	48.1
21	3 26 10.24	13 44 0.1	92.20	21	5 20 41.84	19 25 41.0	47.1
22	3 28 26.58	13 53 13.3	91.52	22	5 23 11.29	19 30 9.0	46.1
23	3 30 43.23	14 2 22.4	90.78	23	5 25 40.95	19 34 29.4	45.1
24	3 33 0.19	N. 14 11 27.1		24	5 28 10.80	N. 19 38 42.2	44.1



MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 21.				SATURDAY 23.			
0	5 28 10.80	N.19 38 42.2	40.87	0	7 30 7.09	N.20 21 33.9	25.18
1	5 30 40.85	19 42 47.4	39.58	1	7 32 39.66	20 19 2.8	26.55
2	5 33 11.08	19 46 44.9	38.28	2	7 35 12.14	20 16 23.5	27.92
3	5 35 41.49	19 50 34.6	37.00	3	7 37 44.53	20 13 36.0	29.28
4	5 38 12.08	19 54 16.6	35.70	4	7 40 16.81	20 10 40.3	30.65
5	5 40 42.85	19 57 50.8	34.38	5	7 42 48.98	20 7 36.4	32.00
6	5 43 13.78	20 1 17.1	33.07	6	7 45 21.03	20 4 24.4	33.35
7	5 45 44.87	20 4 35.5	31.75	7	7 47 52.97	20 1 4.3	34.68
8	5 48 16.12	20 7 46.0	30.40	8	7 50 24.78	19 57 36.2	36.03
9	5 50 47.52	20 10 48.4	29.08	9	7 52 56.47	19 54 0.0	37.35
10	5 53 19.06	20 13 42.9	27.73	10	7 55 28.02	19 50 15.9	38.68
11	5 55 50.74	20 16 29.3	26.38	11	7 57 59.44	19 46 23.8	40.00
12	5 58 22.56	20 19 7.6	25.03	12	8 0 30.70	19 42 23.8	41.32
13	6 0 54.51	20 21 37.8	23.67	13	8 3 1.82	19 38 15.9	42.62
14	6 3 26.58	20 23 59.8	22.32	14	8 5 32.80	19 34 0.2	43.90
15	6 5 58.76	20 26 13.7	20.93	15	8 8 3.61	19 29 36.8	45.22
16	6 8 31.06	20 28 19.3	19.57	16	8 10 34.26	19 25 5.5	46.48
17	6 11 3.47	20 30 16.7	18.20	17	8 13 4.75	19 20 26.6	47.75
18	6 13 35.97	20 32 5.9	16.80	18	8 15 35.07	19 15 40.1	49.03
19	6 16 8.56	20 33 46.7	15.42	19	8 18 5.21	19 10 45.9	50.29
20	6 18 41.25	20 35 19.2	14.03	20	8 20 35.18	19 5 44.2	51.55
21	6 21 14.01	20 36 43.4	12.63	21	8 23 4.97	19 0 34.9	52.78
22	6 23 46.85	20 37 59.2	11.25	22	8 25 34.57	18 55 18.2	54.02
23	6 26 19.76	N.20 39 6.7	9.85	23	8 28 3.99	N.18 49 54.1	55.23
FRIDAY 22.				SUNDAY 24.			
0	6 28 52.73	N.20 40 5.8	8.45	0	8 30 33.20	N.18 44 22.7	56.47
1	6 31 25.76	20 40 56.5	7.03	1	8 33 2.23	18 38 43.9	57.67
2	6 33 58.84	20 41 38.7	5.63	2	8 35 31.06	18 32 57.9	58.87
3	6 36 31.97	20 42 12.5	4.23	3	8 37 59.68	18 27 4.7	60.05
4	6 39 5.13	20 42 37.9	2.82	4	8 40 28.11	18 21 4.4	61.23
5	6 41 38.33	20 42 54.8	1.42	5	8 42 56.32	18 14 57.0	62.40
6	6 44 11.55	20 43 3.3	0.00	6	8 45 24.33	18 8 42.6	63.57
7	6 46 44.79	20 43 3.3	1.40	7	8 47 52.12	18 2 21.2	64.72
8	6 49 18.05	20 42 54.9	2.82	8	8 50 19.70	17 55 52.9	65.88
9	6 51 51.31	20 42 38.0	4.22	9	8 52 47.06	17 49 17.8	66.98
10	6 54 24.58	20 42 12.7	5.63	10	8 55 14.20	17 42 35.9	68.10
11	6 56 57.84	20 41 38.9	7.05	11	8 57 41.11	17 35 47.3	69.22
12	6 59 31.09	20 40 56.6	8.45	12	9 0 7.80	17 28 52.0	70.32
13	7 2 4.32	20 40 5.9	9.85	13	9 2 34.27	17 21 50.1	
14	7 4 37.54	20 39 6.8	11.27	14	9 5 0.51	17 14 41	
15	7 7 10.72	20 37 59.2	12.67	15	9 7 26.52	17 7 2	
16	7 9 43.87	20 36 43.2	14.07	16	9 9 52.29	17 0	
17	7 12 16.97	20 35 18.8	15.47	17	9 12 17.83	16 1	
18	7 14 50.03	20 33 46.0	16.85	18	9 14 43.13		
19	7 17 23.04	20 32 4.9	18.27	19	9 17 8		
20	7 19 55.99	20 30 15.3	19.65	20	9 19 31		
21	7 22 28.87	20 28 17.4	21.03	21	9 21 51		
22	7 25 1.69	20 26 11.2	22.42	22	9 24 1		
23	7 27 34.43	20 23 56.7	23.80	23	9 26 1		
24	7 30 7.09	N.20 21 33.9		24	9 29		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
MONDAY 25.				WEDNESDAY 27.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	9 29 9.94	N.15 57 33.1	82.65	0	11 19 38.08	N.7 53 56.7	116.7
1	9 31 33.57	15 49 17.2	83.60	1	11 21 50.93	7 42 27.4	116.7
2	9 33 56.95	15 40 55.6	84.55	2	11 24 3.60	7 30 55.8	116.7
3	9 36 20.09	15 32 28.3	85.47	3	11 26 16.10	7 19 22.1	116.7
4	9 38 42.98	15 23 55.5	86.40	4	11 28 28.42	7 7 46.2	116.7
5	9 41 5.63	15 15 17.1	87.30	5	11 30 40.57	6 56 8.3	116.7
6	9 43 28.04	15 6 33.3	88.20	6	11 32 52.56	6 44 28.4	116.7
7	9 45 50.20	14 57 44.1	89.08	7	11 35 4.38	6 32 46.6	116.7
8	9 48 12.11	14 48 49.6	89.95	8	11 37 16.03	6 21 2.9	116.7
9	9 50 33.78	14 39 49.9	90.82	9	11 39 27.53	6 9 17.5	116.7
10	9 52 55.21	14 30 45.0	91.65	10	11 41 38.87	5 57 30.4	116.7
11	9 55 16.39	14 21 35.1	92.50	11	11 43 50.06	5 45 41.7	116.7
12	9 57 37.32	14 12 20.1	93.32	12	11 46 1.09	5 33 51.4	116.7
13	9 59 58.01	14 3 0.2	94.13	13	11 48 11.98	5 21 59.6	116.7
14	10 2 18.47	13 53 35.4	94.92	14	11 50 22.72	5 10 6.4	116.7
15	10 4 38.68	13 44 5.9	95.72	15	11 52 33.33	4 58 11.9	116.7
16	10 6 58.64	13 34 31.6	96.48	16	11 54 43.79	4 46 16.0	116.7
17	10 9 18.37	13 24 52.7	97.27	17	11 56 54.12	4 34 19.0	116.7
18	10 11 37.86	13 15 9.1	98.00	18	11 59 4.31	4 22 20.8	116.7
19	10 13 57.11	13 5 21.1	98.73	19	12 1 14.38	4 10 21.5	120.48
20	10 16 16.12	12 55 28.7	99.47	20	12 3 24.31	3 58 21.2	120.48
21	10 18 34.89	12 45 31.9	100.18	21	12 5 34.13	3 46 19.9	120.48
22	10 20 53.43	12 35 30.8	100.88	22	12 7 43.82	3 34 17.8	120.48
23	10 23 11.73	N.12 25 25.5	101.58	23	12 9 53.39	N.3 22 14.9	120.48
TUESDAY 26.				THURSDAY 28.			
	<i>h m s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>° ' "</i>	<i>"</i>
0	10 25 29.80	N.12 15 16.0	102.25	0	12 12 2.85	N.3 10 11.2	120.7
1	10 27 47.64	12 5 2.5	102.92	1	12 14 12.20	2 58 6.8	120.7
2	10 30 5.25	11 54 45.0	103.58	2	12 16 21.44	2 46 1.9	120.7
3	10 32 22.63	11 44 23.5	104.22	3	12 18 30.58	2 33 56.3	121.1
4	10 34 39.78	11 33 58.2	104.83	4	12 20 39.61	2 21 50.3	121.1
5	10 36 56.71	11 23 29.2	105.47	5	12 22 48.54	2 9 43.9	121.1
6	10 39 13.41	11 12 56.4	106.07	6	12 24 57.38	1 57 37.1	121.1
7	10 41 29.89	11 2 20.0	106.65	7	12 27 6.12	1 45 30.1	121.1
8	10 43 46.15	10 51 40.1	107.25	8	12 29 14.78	1 33 22.8	121.1
9	10 46 2.19	10 40 56.6	107.80	9	12 31 23.34	1 21 15.4	121.1
10	10 48 18.02	10 30 9.8	108.37	10	12 33 31.82	1 9 7.9	121.1
11	10 50 33.63	10 19 19.6	108.90	11	12 35 40.22	0 57 0.4	121.1
12	10 52 49.03	10 8 26.2	109.43	12	12 37 48.54	0 44 52.9	121.1
13	10 55 4.22	9 57 29.6	109.97	13	12 39 56.79	0 32 45.5	121.1
14	10 57 19.20	9 46 29.8	110.47	14	12 42 4.96	0 20 38.3	121.1
15	10 59 33.98	9 35 27.0	110.95	15	12 44 13.07	N.0 8 31.4	121.1
16	11 1 48.55	9 24 21.3	111.45	16	12 46 21.11	S.0 3 35.3	121.1
17	11 4 2.93	9 13 12.6	111.92	17	12 48 29.09	0 15 41.6	120.4
18	11 6 17.10	9 2 1.1	112.37	18	12 50 37.00	0 27 47.5	120.4
19	11 8 31.08	8 50 46.9	112.80	19	12 52 44.86	0 39 52.8	120.4
20	11 10 44.86	8 39 29.9	113.25	20	12 54 52.67	0 51 57.6	120.4
21	11 12 58.45	8 28 10.4	113.68	21	12 57 0.42	1 4 1.8	120.4
22	11 15 11.85	8 16 48.3	114.10	22	12 59 8.13	1 16 5.3	120.4
23	11 17 25.06	8 5 23.7	114.50	23	13 1 15.79	1 28 8.1	120.4
24	11 19 38.08	N.7 53 56.7		24	13 3 23.40	S.1 40 10.0	

MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 29.				SATURDAY 30.		
h m s	° ' "	"		h m s	° ' "	"
13 3 23.40	S. 1 40 10.0	120.18	0	13 54 20.61	S. 6 22 13.6	113.63
13 5 30.98	1 52 11.1	120.02	1	13 56 28.04	6 33 35.4	113.25
13 7 38.52	2 4 11.2	119.85	2	13 58 35.49	6 44 54.9	112.83
13 9 46.03	2 16 10.3	119.67	3	14 0 42.96	6 56 11.9	112.42
13 11 53.51	2 28 8.3	119.50	4	14 2 50.47	7 7 26.4	112.00
13 14 0.95	2 40 5.3	119.28	5	14 4 58.01	7 18 38.4	111.57
13 16 8.38	2 52 1.0	119.08	6	14 7 5.58	7 29 47.8	111.12
13 18 15.78	3 3 55.5	118.87	7	14 9 13.18	7 40 54.5	110.67
13 20 23.16	3 15 48.7	118.65	8	14 11 20.82	7 51 58.5	110.20
13 22 30.52	3 27 40.6	118.40	9	14 13 28.50	8 2 59.7	109.72
13 24 37.87	3 39 31.0	118.15	10	14 15 36.22	8 13 58.0	109.25
13 26 45.21	3 51 19.9	117.90	11	14 17 43.98	8 24 53.5	108.75
13 28 52.53	4 3 7.3	117.63	12	14 19 51.78	8 35 46.0	108.25
13 30 59.85	4 14 53.1	117.35	13	14 21 59.63	8 46 35.5	107.75
13 33 7.17	4 26 37.2	117.07	14	14 24 7.53	8 57 22.0	107.22
13 35 14.48	4 38 19.6	116.77	15	14 26 15.47	9 8 5.3	106.70
13 37 21.80	4 50 0.2	116.47	16	14 28 23.47	9 18 45.5	106.17
13 39 29.11	5 1 39.0	116.13	17	14 30 31.52	9 29 22.5	105.62
13 41 36.44	5 13 15.8	115.82	18	14 32 39.62	9 39 56.2	105.05
13 43 43.77	5 24 50.7	115.48	19	14 34 47.78	9 50 26.5	104.50
13 45 51.11	5 36 23.6	115.13	20	14 36 55.99	10 0 53.5	103.92
13 47 58.46	5 47 54.4	114.77	21	14 39 4.26	10 11 17.0	103.35
13 50 5.83	5 59 23.0	114.40	22	14 41 12.60	10 21 37.1	102.75
13 52 13.21	6 10 49.4	114.03	23	14 43 20.99	10 31 53.6	102.15
13 54 20.61	S. 6 22 13.6		24	14 45 29.44	S. 10 42 6.5	

PHASES OF THE MOON.

	d	h	m
● New Moon - - - - -	3	14	40.1
☾ First Quarter - - - - -	11	11	15.0
○ Full Moon - - - - -	19	4	34.8
☾ Last Quarter - - - - -	26	0	32.4

☾ Apogee - - - - -	
☾ Perigee - - - - -	



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.		Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .
1	Pollux	W.	73° 37' 10"	2371	75° 21' 27"	2375	77° 5' 38"	2380	78° 49'
	Regulus	W.	37 30 19	2323	39 15 45	2328	41 1 4	2333	42 46
	SUN	E.	33 50 26	2700	32 13 46	2711	30 37 21	2723	29 1
5	SUN	W.	17 47 53	3149	19 15 3	3138	20 42 26	3135	22 9
	Venus	E.	26 33 40	3083	25 5 9	3123	23 37 27	3171	22 10
	α Aquilæ	E.	61 25 58	3391	60 3 31	3431	58 41 49	3472	57 20
	Fomalhaut	E.	93 23 17	2879	91 50 31	2891	90 18 0	2905	88 45
	α Pegasi	E.	108 28 19	3019	106 58 30	3026	105 28 49	3034	103 59
6	SUN	W.	29 26 32	3161	30 53 28	3170	32 20 13	3179	33 46
	α Aquilæ	E.	50 49 18	3781	49 33 56	3846	48 19 41	3916	47 6
	Fomalhaut	E.	81 9 6	2992	79 38 43	3007	78 8 39	3023	76 38
	α Pegasi	E.	96 34 26	3092	95 6 6	3104	93 38 1	3115	92 10
7	SUN	W.	40 56 26	3245	42 21 42	3257	43 46 44	3267	45 11
	Fomalhaut	E.	69 15 32	3129	67 47 57	3148	66 20 45	3166	64 53
	α Pegasi	E.	84 54 49	3196	83 28 35	3211	82 2 39	3225	80 37
	Saturn	E.	110 3 2	2821	108 29 1	2834	106 55 17	2845	105 21
8	SUN	W.	52 12 22	3334	53 35 54	3345	54 59 14	3354	56 22
	Venus	W.	13 22 8	4023	14 33 25	3875	15 47 10	3765	17 2
	Fomalhaut	E.	57 45 49	3292	56 21 28	3315	54 57 34	3339	53 34
	α Pegasi	E.	73 33 20	3321	72 9 33	3338	70 46 6	3356	69 22
	Saturn	E.	97 38 8	2913	96 6 6	2924	94 34 17	2934	93 2
9	SUN	W.	63 15 25	3408	64 37 32	3416	65 59 30	3423	67 21
	Venus	W.	23 37 46	3471	24 58 43	3451	26 20 2	3434	27 41
	Fomalhaut	E.	46 44 33	3508	45 24 18	3543	44 4 41	3579	42 45
	α Pegasi	E.	62 32 40	3471	61 11 43	3491	59 51 9	3513	58 30
	Saturn	E.	85 27 35	2986	83 57 5	2993	82 26 44	3001	80 56
	α Arietis	E.	105 1 4	3168	103 34 16	3172	102 7 33	3177	100 40
10	SUN	W.	74 8 47	3457	75 29 59	3462	76 51 6	3464	78 12
	Venus	W.	34 33 3	3376	35 55 47	3371	37 18 37	3365	38 41
	Fomalhaut	E.	36 22 42	3871	35 8 53	3937	33 56 11	4013	32 44
	α Pegasi	E.	51 56 47	3666	50 39 24	3696	49 22 33	3729	48 6
	Saturn	E.	73 27 27	3034	71 57 56	3039	70 28 31	3042	68 59
11	α Arietis	E.	93 29 23	3204	92 3 19	3209	90 37 20	3212	89 11
	SUN	W.	84 56 46	3475	86 17 38	3476	87 38 29	3475	88 59
	Venus	W.	45 37 41	3336	47 1 11	3331	48 24 47	3326	49 48
	α Pegasi	E.	41 54 59	3985	40 43 5	4043	39 32 8	4105	38 22
	Saturn	E.	61 33 9	3053	60 4 2	3053	58 34 55	3052	57 5
12	α Arietis	E.	82 2 36	3226	80 36 57	3227	79 11 20	3228	77 45
	SUN	W.	95 44 12	3460	97 5 21	3456	98 26 34	3452	99 47
	Venus	W.	56 48 43	3288	58 13 9	3281	59 37 43	3273	61 2
	α Aquilæ	W.	39 26 58	4779	40 26 52	4670	41 28 17	4571	42 31
	Saturn	E.	49 39 42	3040	48 10 19	3037	46 40 52	3033	45 11
	α Arietis	E.	70 37 52	3230	69 12 18	3228	67 46 42	3228	66 21
13	Aldebaran	E.	101 58 39	3058	100 29 38	3054	99 0 32	3050	97 31
	SUN	W.	106 36 4	3413	107 58 6	3404	109 20 18	3396	110 42
	Venus	W.	68 8 35	3219	69 34 22	3208	71 0 22	3197	72 26

MEAN TIME.

LUNAR DISTANCES.

Star's Name and Position.		Midnight.			P.L. of diff.	XV <sup>h</sup> .			P.L. of diff.	XVIII <sup>h</sup> .			P.L. of diff.	XXI <sup>h</sup> .			P.L. of diff.
		o	i	u		o	i	u		o	i	u		o	i	u	
ollux	W.	80	33	38	2390	82	17	27	2396	84	1	7	2403	85	44	38	2410
egulus	W.	44	31	17	2344	46	16	12	2351	48	0	57	2358	49	45	32	2365
N	E.	27	25	21	2751	25	49	49	2769	24	14	41	2789	22	39	59	2812
N	W.	23	37	23	3186	25	4	49	3139	26	32	11	3145	27	59	26	3152
enus	E.	20	45	5	3291	19	20	43	3370	17	57	52	3465	16	36	49	3585
Aquilæ	E.	56	0	46	3562	54	41	30	3611	53	23	8	3664	52	5	43	3721
omalhaut	E.	87	13	50	2931	85	42	11	2946	84	10	51	2961	82	39	49	2976
Pegasi	E.	102	29	56	3051	101	0	46	3060	99	31	47	3069	98	3	0	3080
N	W.	35	13	9	3200	36	39	18	3211	38	5	14	3223	39	30	56	3233
Aquilæ	E.	45	54	48	4071	44	44	18	4159	43	35	13	4253	42	27	37	4356
omalhaut	E.	75	9	32	3057	73	40	30	3074	72	11	49	3092	70	43	30	3110
Pegasi	E.	90	42	34	3140	89	15	13	3154	87	48	9	3168	86	21	21	3181
N	W.	46	36	9	3290	48	0	32	3303	49	24	40	3315	50	48	38	3324
omalhaut	E.	63	27	29	3206	62	1	27	3226	60	35	49	3247	59	10	36	3270
Pegasi	E.	79	11	39	3256	77	46	36	3272	76	21	52	3288	74	57	26	3305
turn	E.	103	48	35	2870	102	15	37	2880	100	42	53	2891	99	10	23	2903
N	W.	57	45	20	3373	59	8	7	3383	60	30	43	3392	61	53	9	3401
enus	W.	18	19	57	3617	19	38	13	3566	20	57	24	3527	22	17	18	3497
omalhaut	E.	52	11	10	3391	50	48	43	3418	49	26	47	3447	48	5	23	3477
Pegasi	E.	68	0	13	3392	66	37	47	3411	65	15	43	3431	63	54	1	3449
turn	E.	91	31	17	2953	90	0	5	2962	88	29	4	2970	86	58	14	2979
N	W.	68	43	3	3436	70	4	39	3443	71	26	7	3447	72	47	30	3453
enus	W.	29	3	34	3408	30	25	41	3399	31	47	59	3390	33	10	27	3383
omalhaut	E.	41	27	30	3661	40	10	1	3707	38	53	21	3756	37	37	33	3811
Pegasi	E.	57	11	15	3559	55	51	56	3585	54	33	5	3610	53	14	41	3637
turn	E.	79	26	29	3014	77	56	33	3019	76	26	44	3026	74	57	3	3030
Arietis	E.	99	14	28	3187	97	48	3	3193	96	21	45	3196	94	55	31	3201
N	W.	79	33	9	3471	80	54	6	3472	82	15	1	3474	83	35	54	3475
enus	W.	40	4	36	3355	41	27	44	3351	42	50	57	3345	44	14	16	3340
omalhaut	E.	31	34	38	4190	30	26	2	4296	29	19	6	4418	28	14	1	4557
Pegasi	E.	46	50	38	3802	45	35	38	3842	44	21	19	3886	43	7	45	3933
turn	E.	67	29	53	3048	66	0	39	3049	64	31	27	3051	63	2	17	3052
Arietis	E.	87	45	33	3218	86	19	45	3220	84	53	59	3212	83	28	16	3225
N	W.	90	20	14	3472	91	41	10	3471	93	2	17	3475	94	23	8	3464
enus	W.	51	12	18	3314	52	36	13	3307	54	0	1	3308	55	24	25	3294
Pegasi	E.	37	13	21	4252	36	5	44	4338	34	50	1	4338	33	54	36	4543
turn	E.	55	36	39	3050	54	7	28	3049	52	38	1	3049	51	9	1	3043
Arietis	E.	76	20	9	3230	74	18	35	3230	73	21	1	3230	72	1	27	3229
N	W.	101	9	16	3440	100	2	47	3434	98	1	1	3434	97	1	1	3420
enus	W.	62	27	19	3256	63	1	1	3241	61	1	1	3241	60	1	1	3228
Aquilæ	W.	43	35	15	4398	44	1	1	4382	42	1	1	4382	41	1	1	4365
turn	E.	43	41	42	3023	42	1	1	3018	40	1	1	3018	39	1	1	3006
Arietis	E.	64	55	29	3226	63	1	1	3211	61	1	1	3211	60	1	1	3194
debaran	E.	96	2	4	3039	94	1	1	3039	92	1	1	3039	91	1	1	3024
N	W.	112	5	10	3378	113	1	1	3378	111	1	1	3378	110	1	1	3363
enus	W.	73	53	0	3175	74	1	1	3175	72	1	1	3175	71	1	1	3160



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX	
		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup> <sup>'</sup> <sup>"</sup>		<sup>o</sup>	
13	$\alpha$ Aquilæ W.	48 3 30	4124	49 13 9	4067	50 23 43	4013	51 3	
	Saturn E.	37 42 4	2998	36 11 49	2992	34 41 26	2985	33 1	
	$\alpha$ Arietis E.	59 12 51	3222	57 47 8	3222	56 21 25	3222	54 1	
	Aldebaran E.	90 3 43	3013	88 33 46	3006	87 3 40	2998	85 3	
14	SUN W.	117 37 7	3336	119 0 37	3325	120 24 20	3313	121 4	
	Venus W.	79 41 4	3125	81 8 43	3112	82 36 38	3100	84	
	$\alpha$ Aquilæ W.	57 44 9	3749	59 0 4	3713	60 16 37	3678	61	
	Saturn E.	25 35 38	2934	24 4 2	2925	22 32 15	2916	21	
	$\alpha$ Arietis E.	47 47 16	3230	46 21 42	3234	44 56 13	3239	43	
	Aldebaran E.	77 59 15	2941	76 27 48	2929	74 56 6	2919	73	
15	SUN W.	128 51 30	3238	130 16 54	3225	131 42 34	3212	133	
	Venus W.	91 30 1	3014	92 59 57	2998	94 30 13	2983	96	
	$\alpha$ Aquilæ W.	68 8 7	3498	69 28 34	3471	70 49 30	3446	72	
	Fomalhaut W.	33 48 31	3729	35 4 47	3649	36 22 28	3578	37	
	$\alpha$ Arietis E.	36 26 56	3319	35 3 6	3344	33 39 46	3374	32	
	Aldebaran E.	65 40 48	2845	64 7 19	2832	62 33 33	2819	60	
16	Venus W.	103 38 33	2888	105 11 7	2873	106 44 1	2857	108	
	$\alpha$ Aquilæ W.	79 4 35	3311	80 28 34	3292	81 52 55	3272	83	
	Fomalhaut W.	44 32 54	3252	45 58 2	3209	47 24 0	3171	48	
	$\alpha$ Pegasi W.	32 59 17	4198	34 7 45	4067	35 18 19	3948	36	
	Aldebaran E.	53 4 44	2735	51 28 51	2721	49 52 39	2707	48	
	Pollux E.	97 12 46	2779	95 37 51	2764	94 2 36	2750	92	
17	$\alpha$ Aquilæ W.	90 26 20	3175	91 52 59	3162	93 19 54	3150	94	
	Fomalhaut W.	56 14 54	2976	57 45 37	2949	59 16 54	2922	60	
	$\alpha$ Pegasi W.	42 57 58	3439	44 19 30	3377	45 42 13	3320	47	
	Aldebaran E.	40 8 41	2620	38 30 13	2606	36 51 26	2591	35	
	Pollux E.	84 24 23	2663	82 46 53	2649	81 9 4	2635	79	
18	Fomalhaut W.	68 35 32	2787	70 10 17	2768	71 45 27	2750	73	
	$\alpha$ Pegasi W.	54 19 10	3054	55 48 16	3020	57 18 4	2986	58	
	Saturn W.	25 52 59	2502	27 34 11	2487	29 15 43	2472	30	
	Aldebaran E.	26 51 56	2510	25 10 56	2497	23 29 38	2484	21	
	Pollux E.	71 15 38	2554	69 35 41	2543	67 55 27	2531	66	
	Regulus E.	106 59 50	2507	105 18 46	2492	103 37 22	2480	101	
19	Fomalhaut W.	81 24 27	2655	83 2 7	2641	84 40 6	2629	86	
	$\alpha$ Pegasi W.	66 30 2	2828	68 3 54	2806	69 38 14	2786	71	
	Saturn W.	39 31 33	2396	41 15 13	2385	42 59 10	2373	44	
	$\alpha$ Arietis W.	23 53 8	3470	25 14 6	3331	26 37 42	3213	28	
	Pollux E.	57 48 35	2468	56 6 37	2460	54 24 27	2451	52	
	Regulus E.	93 22 46	2407	91 39 21	2395	89 55 39	2384	88	
20	Fomalhaut W.	94 33 11	2572	96 12 45	2566	97 52 27	2559	99	
	$\alpha$ Pegasi W.	79 12 28	2692	80 49 19	2680	82 26 26	2669	84	
	Saturn W.	53 28 8	2315	55 13 45	2307	56 59 35	2299	58	
	$\alpha$ Arietis W.	35 38 41	2783	37 13 31	2739	38 49 19	2701	40	
	Pollux E.	44 8 4	2419	42 24 57	2418	40 41 48	2418	38	
	Regulus E.	79 28 19	2327	77 42 59	2318	75 57 26	2311	74	
21	Saturn W.	67 38 16	2260	69 25 15	2255	71 12 21	2250	72	



MEAN TIME.

LUNAR DISTANCES.

Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
	° ' "		° ' "		° ' "		° ' "	
α Aquilæ W.	52 47 27	3915	54 0 31	3870	55 14 21	3828	56 28 54	3788
Saturn E.	31 40 11	2969	30 9 19	2961	28 38 17	2951	27 7 3	2943
α Arietis E.	53 29 59	3221	52 4 15	3223	50 38 33	3225	49 12 53	3227
Aldebaran E.	84 2 58	2980	82 32 20	2971	81 1 31	2961	79 30 29	2951
SUN W.	123 12 26	3289	124 36 50	3277	126 1 28	3264	127 26 22	3252
Venus W.	85 33 16	3071	87 2 1	3057	88 31 3	3043	90 0 23	3028
α Aquilæ W.	62 51 32	3613	64 9 52	3583	65 28 45	3553	66 48 11	3523
Saturn E.	19 28 6	2899	17 55 46	2891	16 23 16	2884	14 50 36	2880
α Arietis E.	42 5 37	3256	40 40 34	3267	39 15 44	3281	37 51 10	3298
Aldebaran E.	71 52 1	2896	70 19 37	2883	68 46 56	2871	67 14 0	2859
SUN W.	134 34 40	3185	136 1 7	3171	137 27 51	3158	138 54 50	3144
Venus W.	97 31 41	2952	99 2 54	2936	100 34 27	2920	102 6 20	2905
α Aquilæ W.	73 32 47	3398	74 55 6	3375	76 17 51	3353	77 41 1	3332
Fomalhaut W.	39 1 38	3452	40 22 56	3395	41 45 18	3345	43 8 38	3296
α Arietis E.	30 51 57	3456	29 33 44	3510	28 13 31	3577	26 54 32	3657
Aldebaran E.	59 25 9	2791	57 50 30	2778	56 15 33	2764	54 40 18	2750
Venus W.	109 50 50	2825	111 21 45	2809	112 59 1	2794	114 33 37	2778
α Aquilæ W.	81 42 44	3237	86 8 9	3220	87 33 51	3204	88 59 58	3189
Fomalhaut W.	50 18 13	3099	51 46 24	3066	53 15 15	3034	54 44 46	3004
α Pegasi W.	37 45 10	3746	39 1 9	3658	40 18 41	3578	41 37 39	3505
Aldebaran E.	46 39 18	2678	45 2 8	2663	43 21 39	2649	41 46 50	2634
Pollux E.	90 51 9	2721	89 14 57	2706	87 38 25	2692	86 1 34	2677
α Aquilæ W.	96 14 27	3127	97 42 4	3119	99 9 51	3110	100 37 49	3102
Fomalhaut W.	62 21 8	2873	63 54 1	2851	65 27 23	2828	67 1 14	2808
α Pegasi W.	48 30 50	3219	49 56 37	3173	51 23 18	3131	52 50 50	3092
Aldebaran E.	33 32 52	2563	31 53 6	2550	30 13 2	2535	28 32 38	2522
Pollux E.	77 52 29	2607	76 13 43	2593	74 34 39	2581	72 55 18	2567
Fomalhaut W.	74 56 59	2714	76 33 20	2698	78 10 2	2684	79 47 4	2668
α Pegasi W.	60 19 42	2927	61 51 27	2899	63 23 47	2874	64 56 39	2850
Saturn W.	32 39 46	2446	34 22 15	2433	36 5 3	2420	37 48 9	2407
Aldebaran E.	20 6 9	2460	18 24 0	2450	16 41 36	2439	14 58 57	2430
Pollux E.	64 34 10	2508	62 53 8	2497	61 11 51	2487	59 30 20	2477
Regulus E.	100 13 41	2454	98 31 23	2442	96 48 48	2430	95 5 56	2417
Fomalhaut W.	87 56 52	2607	89 35 37	2597	91 14 26	2581	92 53 48	2580
α Pegasi W.	72 48 11	2750	74 23 44	2734	75 7 1	2719	77 35 54	2705
Saturn W.	46 27 51	2353	48 12 34	2342	50 0 0	2330	51 42 43	2324
α Arietis W.	29 31 31	3027	31 1 10	3017	32 50 0	3007	34 4 55	2997
Pollux E.	50 59 33	2438	49 16 52	2428	47 30 0	2418	45 1 6	2408
Regulus E.	86 27 30	2364	84 43 3	2354	82 0 0	2344	79 27 0	2334
Fomalhaut W.	101 12 16	2551	102 52 19	2541	104 32 22	2531	106 12 25	2521
α Pegasi W.	85 41 22	2651	87 19 8	2641	89 0 0	2631	90 0 0	2621
Saturn W.	60 31 49	2285	62 18 11	2275	64 0 0	2265	66 0 0	2255
α Arietis W.	42 3 24	2635	43 41 32	2625	45 0 0	2615	47 0 0	2605
Pollux E.	37 15 31	2421	35 32 26	2411	33 0 0	2401	31 0 0	2391
Regulus E.	72 25 47	2296	70 39 42	2286	68 0 0	2276	66 0 0	2266
Saturn W.	74 46 53	2242	76 34 18	2232	78 0 0	2222	80 0 0	2212



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P.L. of diff.	III <sup>h</sup> .	P.L. of diff.	VI <sup>h</sup> .	P.L. of diff.	IX <sup>h</sup> .	
		° ' "		° ' "		° ' "		° ' "	
21	α Arietis W.	48 39 30	2538	50 19 50	2520	52 0 35	2503	53 4	
	Aldebaran W.	14 51 37	2281	16 38 4	2275	18 24 41	2268	20 1	
	Pollux E.	30 24 8	2456	28 41 53	2473	27 0 2	2496	25 1	
	Regulus E.	65 20 30	2272	63 33 49	2267	61 47 1	2262	60	
	Jupiter E.	112 25 33	2336	110 40 26	2331	108 55 11	2326	107	
22	Saturn W.	81 57 0	2231	83 44 41	2229	85 32 25	2228	87 2	
	α Arietis W.	62 12 4	2434	63 54 51	2426	65 37 49	2419	67 2	
	Aldebaran W.	29 7 0	2245	30 54 21	2242	32 41 46	2241	34 2	
	Regulus E.	51 4 11	2244	49 16 49	2241	47 29 23	2240	45 4	
	Jupiter E.	98 21 35	2306	96 35 44	2303	94 49 49	2302	93	
	SUN E.	143 2 28	2602	141 23 35	2596	139 44 34	2591	138	
23	Saturn W.	96 19 16	2226	98 7 4	2227	99 54 51	2229	101 4	
	α Arietis W.	75 58 15	2396	77 41 55	2395	79 25 37	2394	81	
	Aldebaran W.	43 26 46	2238	45 14 17	2239	47 1 47	2240	48 4	
	Regulus E.	36 44 25	2240	34 56 57	2241	33 9 30	2242	31 2	
	Jupiter E.	84 13 51	2300	82 27 51	2300	80 41 52	2302	78 5	
	Spica ♀ E.	90 38 24	2268	88 51 38	2269	87 4 53	2270	85 18	
	SUN E.	129 49 0	2580	128 9 38	2579	126 30 14	2580	124 50	
24	Aldebaran W.	57 45 58	2252	59 33 9	2255	61 20 15	2258	63 7	
	Pollux W.	15 43 54	2866	17 16 57	2757	18 52 21	2675	20 29	
	Jupiter E.	70 6 53	2315	68 21 15	2319	66 35 43	2322	64 50	
	Spica ♀ E.	76 25 20	2285	74 38 58	2288	72 52 41	2292	71 6	
	SUN E.	116 34 20	2588	114 55 9	2591	113 16 2	2594	111 36	
25	Aldebaran W.	72 1 5	2280	73 47 34	2285	75 33 56	2289	77 20	
	Pollux W.	28 51 8	2463	30 33 13	2449	32 15 38	2438	33 58	
	Jupiter E.	56 4 21	2346	54 19 29	2351	52 34 44	2357	50 50	
	Spica ♀ E.	62 17 14	2321	60 31 45	2326	58 46 24	2333	57 1	
	SUN E.	103 22 55	2617	101 44 23	2621	100 5 56	2626	98 27	
26	Pollux W.	42 33 54	2411	44 17 13	2410	46 0 33	2410	47 43	
	Jupiter E.	42 9 1	2391	40 25 14	2398	38 41 37	2405	36 58	
	Spica ♀ E.	48 17 45	2376	46 33 36	2386	44 49 41	2394	43 5	
	SUN E.	90 17 37	2686	88 39 58	2662	87 2 27	2668	85 25	
27	Pollux W.	56 19 58	2423	58 3 0	2427	59 45 57	2430	61 28	
	Regulus W.	20 3 32	2370	21 47 50	2374	23 32 2	2379	25 16	
	Jupiter E.	28 23 37	2455	26 41 21	2466	24 59 20	2478	23 17	
	Spica ♀ E.	34 31 19	2467	32 49 19	2483	31 7 42	2501	29 26	
	SUN E.	77 20 6	2704	75 43 31	2710	74 7 4	2717	72 30	
28	Pollux W.	70 1 36	2458	71 43 48	2463	73 25 54	2468	75 7	
	Regulus W.	33 54 36	2412	35 37 53	2418	37 21 2	2424	39 4	
	SUN E.	64 31 30	2757	62 56 6	2764	61 20 51	2771	59 45	
29	Pollux W.	83 35 40	2504	85 16 48	2510	86 57 47	2517	88 38	
	Regulus W.	47 36 52	2462	49 18 59	2469	51 0 56	2476	52 42	
	SUN E.	51 52 46	2817	50 18 40	2826	48 44 46	2834	47 11	
30	Regulus W.	61 9 15	2517	62 50 4	2525	64 30 42	2533	66 11	
	Jupiter W.	12 54 25	2726	14 30 30	2702	16 7 7	2687	17 44	
	SUN E.	39 25 14	2889	37 52 41	2898	36 20 20	2910	34 48	



## MEAN TIME.

## LUNAR DISTANCES.

the MONTH.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>b</sup> .	P. L. of diff.	XVIII <sup>b</sup> .	P. L. of diff.	XXI <sup>b</sup> .	P. L. of diff.
		° ' "		° ' "		° ' "		° ' "	
1	α Arietis W.	55 23 13	2475	57 5 2	2463	58 47 8	2452	60 29 29	2442
	Aldebaran W.	21 58 22	2258	23 45 23	2254	25 32 30	2250	27 19 43	2247
	Pollux E.	23 38 3	2561	21 58 15	2610	20 19 34	2672	18 42 17	2757
	Regulus E.	58 13 5	2255	56 25 59	2251	54 38 47	2248	52 51 31	2245
	Jupiter E.	105 24 21	2318	103 38 47	2314	101 53 8	2310	100 7 23	2308
2	Saturn W.	89 7 59	2226	90 55 48	2226	92 43 37	2225	94 31 27	2226
	α Arietis W.	69 4 13	2409	70 47 35	2404	72 31 4	2401	74 14 38	2398
	Aldebaran W.	36 16 41	2239	38 4 11	2237	39 51 43	2237	41 39 15	2238
	Regulus E.	43 54 26	2239	42 6 56	2239	40 19 26	2238	38 31 55	2238
	Jupiter E.	91 17 53	2300	89 31 53	2299	87 45 52	2299	85 59 51	2300
	SUN E.	136 26 16	2585	134 47 1	2583	133 7 43	2581	131 28 22	2580
3	Saturn W.	103 30 19	2232	105 17 59	2234	107 5 36	2237	108 53 9	2239
	α Arietis W.	82 53 3	2395	84 36 45	2396	86 20 26	2397	88 4 5	2400
	Aldebaran W.	50 36 41	2243	52 24 5	2245	54 11 26	2247	55 58 44	2249
	Regulus E.	29 34 43	2246	27 47 24	2249	26 0 9	2252	24 12 59	2255
	Jupiter E.	77 10 1	2305	75 24 9	2307	73 38 20	2309	71 52 34	2313
	Spica ♀ E.	83 31 29	2274	81 44 51	2276	79 58 17	2279	78 11 46	2282
	SUN E.	123 11 29	2582	121 32 9	2583	119 52 50	2584	118 13 33	2587
4	Aldebaran W.	64 54 13	2265	66 41 4	2268	68 27 50	2272	70 14 31	2276
	Pollux W.	22 8 9	2567	23 47 49	2532	25 28 18	2503	27 9 27	2480
	Jupiter E.	63 4 52	2329	61 19 35	2333	59 34 24	2337	57 49 19	2342
	Spica ♀ E.	69 20 25	2301	67 34 27	2305	65 48 35	2310	64 2 50	2316
	SUN E.	109 58 0	2601	108 19 6	2604	106 40 17	2609	105 1 34	2612
5	Aldebaran W.	79 6 21	2299	80 52 22	2303	82 38 17	2308	84 24 5	2313
	Pollux W.	35 41 11	2423	37 24 13	2417	39 7 23	2414	40 50 37	2412
	Jupiter E.	49 5 38	2367	47 21 16	2373	45 37 3	2379	43 52 58	2385
	Spica ♀ E.	55 16 11	2346	53 31 18	2353	51 46 36	2361	50 2 5	2369
	SUN E.	96 49 23	2635	95 11 16	2641	93 33 16	2646	91 55 23	2651
6	Pollux W.	49 27 12	2413	51 10 28	2415	52 53 42	2417	54 36 52	2420
	Jupiter E.	35 14 52	2419	33 31 45	2428	31 48 50	2436	30 6 7	2446
	Spica ♀ E.	41 22 30	2415	39 39 17	2426	37 56 19	2439	36 13 40	2452
	SUN E.	83 47 48	2679	82 10 40	2686	80 33 41	2691	78 56 49	2698
7	Pollux W.	63 11 35	2438	64 54 15	2443	66 36 48	2448	68 19 15	2452
	Regulus W.	27 0 4	2389	28 43 54	2395	30 27 36	2401	32 11 10	2406
	Jupiter E.	21 36 10	2507	19 55 6	2525	18 14 28	2546	16 22 19	2574
	Spica ♀ E.	27 45 46	2545	26 5 35	2572	24 26 1	2604	22 37 11	2642
	SUN E.	70 54 37	2730	69 18 37	2736	67 42 45	2744	65 50 3	2750
8	Pollux W.	76 49 42	2479	78 31 25	2486	80 12 58	2491	82 3 24	2499
	Regulus W.	40 46 55	2436	42 29 38	2441	44 12 11	2446	46 3 36	2453
	SUN E.	58 10 50	2786	56 36 4	2791	54 1 28	2801	52 1 2	2809
9	Pollux W.	90 19 16	2531	91 59 46	2537	93 40 7	2543	95 17 25	2553
	Regulus W.	54 24 22	2490	56 5 50	2496	57 47 9	2502	59 17 25	2511
	SUN E.	45 37 29	2852	44 4 8	2857	42 30 58	2863	40 59 59	2870
10	Regulus W.	67 51 26	2548	69 31 33	2554	71 11 28	2560	73 13 29	2572
	Jupiter W.	19 21 12	2674	20 58 2	2679	22 35 45	2685	24 3 26	2693
	SUN E.	33 16 21	2932	31 44 2	2937	30 13 21	2943	28 14 29	2971



## CONFIGURATIONS OF THE SATELLITES OF JUPITER

At 17<sup>h</sup> 30<sup>m</sup>, MEAN TIME.

Day of the Month.	West.	East.
1		○ 1 2 3 4
2		○ 1 2 3 4
3		○ 1 2 3 4
4		○ 1 2 3 4
5		○ 1 2 3 4
6		○ 1 2 3 4
7	1 ○	○ 1 2 3 4
8		○ 1 2 3 4
9		○ 1 2 3 4
10		○ 1 2 3 4
11		○ 1 2 3 4
12		○ 1 2 3 4
13		○ 1 2 3 4
14		○ 1 2 3 4
15	1 ●	○ 1 2 3 4
16		○ 1 2 3 4
17		○ 1 2 3 4
18		○ 1 2 3 4
19		○ 1 2 3 4
20		○ 1 2 3 4
21		○ 1 2 3 4
22	1 ●	○ 1 2 3 4
23	2 ○	○ 1 2 3 4
24		○ 1 2 3 4
25		○ 1 2 3 4
26		○ 1 2 3 4
27		○ 1 2 3 4
28		○ 1 2 3 4
29		○ 1 2 3 4
30	1 ○	○ 1 2 3 4

This Table represents, at 17<sup>h</sup> 30<sup>m</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitude) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of the Satellites' motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A circle (○) at the left or right hand of the page, denotes that the Satellite placed by the side of the disc of Jupiter, and a black circle (●) that it is either *behind* the disc, or in the *shadow* of Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

SATELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	
	1	11 0 56.5	1 44 25.0	Im.
	3	5 29 28.5	20 19 55.6	Im.
	4	23 57 54.6	14 55 20.4	Im.
	6†	18 26 26.1	9 30 50.5	Im.
	8	12 54 49.3	4 6 12.4	Im.
	10	7 23 20.3	22 41 42.0	Im.
	12	1 51 45.3	17 17 5.6	Im.
	13	20 20 15.6	11 52 34.6	Im.
	15	14 48 37.9	6 27 55.5	Im. i *
	17	9 17 7.6	1 3 23.9	Im.
	19	3 45 31.3	19 38 46.2	Im.
	20	22 14 0.7	14 14 14.2	Im.
	22*	16 42 22.1	8 49 34.2	Im.
	24	11 10 50.8	3 25 1.7	Im.
	26	5 39 13.4	22 0 22.9	Im.
	28	0 7 41.9	16 35 50.0	Im.
	29*	18 36 2.1	11 11 8.9	Im.
II.	4	1 47 25.3	16 41 12.5	Im.
	7	15 4 0.4	6 11 48.1	Im.
	11	4 20 33.8	19 42 22.0	Im. i *
	14*	17 37 6.0	9 12 54.7	Im.
	18	6 53 37.2	22 43 26.4	Im.
	21	20 10 7.1	12 13 56.8	Im.
	25	9 26 36.6	1 44 26.9	Im.
	28	22 43 4.3	15 14 55.1	Im.
III.	7	14 9 27.5	5 17 6.3	Im.
	14*	18 7 11.9	9 43 5.6	Im. i *
	14	20 52 58.1	12 29 19.0	Em. e *
	21	22 4 56.1	14 9 4.7	Im.
	22	0 49 48.8	16 54 24.5	Em.
	29	2 3 3.9	18 35 27.5	Im.
	29	4 47 3.1	21 19 53.6	Em.



APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.				TRANSITS OF SHADOWS.			
	Immersion.	Emersion.	Ingress.		Egress.		Ingress.		Egress.	
	d h m	d h m	d h m	d h m	d h m	d h m	d h m	d h m	d h m	d h m
I.		1 4 33	2 23 37	2 1 52	2 23 1	2 1				
		3 23 10	4 18 14	4 20 29	4 17 36	4 19				
		5 17 47	5 12 50	6 15 6	5 12 12	5 14				
		6 12 24	7† 7 27	7† 9 43	7 6 47	7* 9				
	In	8 7 1	9 2 4	9 4 20	9 1 22	9 3				
		10 1 38	11 20 41	11 22 56	11 19 58	11 22				
		12 20 15	12 15 18	13 17 33	12 14 33	13 16				
		13 14 53	14* 9 54	14 12 10	14* 9 8	14 11				
	the	15* 9 29	16 4 31	16 6 47	16 3 43	16 5				
		17 4 5	18 23 8	18 1 23	18 22 19	18 0				
		19 22 42	20 17 45	20 20 0	20 16 54	20 19				
		21 17 19	21 12 21	21 14 36	21† 11 29	21 13				
	Shadow.	22 11 56	23 6 58	23* 9 13	23 6 4	23* 8				
		24 6 32	25 1 34	25 3 49	25 0 39	25 2				
		26 1 9	27 20 11	27 22 26	27 19 15	27 21				
		28 19 46	28 14 47	29 17 2	28 13 50	28 16				
		29 14 22	30* 9 23	30† 11 38	30* 8 25	30* 10				
II.		4 20 37	2 22 58	2 1 44	2 21 48	2				
		7 10 13	5 12 36	6 15 21	5 11 20	5 1				
	In	11 23 50	9 2 15	9 5 0	9 0 53	9				
		14 13 26	13 15 52	13 18 37	12 14 24	13 1				
	the	18 3 2	16 5 31	16* 8 16	16 3 57	16				
		22 16 38	20 19 8	20 21 52	20 17 28	20 2				
	Shadow.	25 6 13	23* 8 46	23† 11 30	23 7 1	23*				
		29 19 49	27 22 23	27 1 6	27 20 32	27 3				
			30† 12 0	30 14 43	30* 10 5	30				
III.	In the Shadow.	7 10 54	4 17 22	4 20 22	3 14 51	4 1				
		14 12 46	15 15 43	11 22 14	11 1 12	11 2				
		22 17 36	22 20 30	18 3 5	18 6 0	18				
		29 22 24	29 1 15	25† 7 53	25* 10 46	25 4 9				

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>d</sup> .629573. Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	+1.1616	+1.1112	+9.7341	+0.7654	9 16 48.66	223	304	.832
2	1.1553	1.1203	9.7360	0.7663	9 12 52.75	224	305	.835
3	1.1488	1.1291	9.7379	0.7672	9 8 56.84	225	306	.838
4	+1.1420	+1.1377	+9.7398	+0.7681	9 5 0.93	226	307	.841
5	1.1349	1.1459	9.7418	0.7690	9 1 5.02	227	308	.843
6	1.1277	1.1539	9.7437	0.7699	8 57 9.11	228	309	.846
7	+1.1201	+1.1615	+9.7457	+0.7708	8 53 13.21	229	310	.849
8	1.1123	1.1690	9.7477	0.7717	8 49 17.30	230	311	.851
9	1.1042	1.1761	9.7497	0.7727	8 45 21.39	231	312	.854
10	+1.0957	+1.1831	+9.7517	+0.7736	8 41 25.48	232	313	.857
11	1.0870	1.1897	9.7538	0.7744	8 37 29.57	233	314	.860
12	1.0780	1.1962	9.7558	0.7753	8 33 33.66	234	315	.862
13	+1.0686	+1.2024	+9.7579	+0.7762	8 29 37.75	235	316	.865
14	1.0589	1.2084	9.7600	0.7771	8 25 41.84	236	317	.868
15	1.0489	1.2142	9.7620	0.7779	8 21 45.93	237	318	.871
16	+1.0384	+1.2198	+9.7641	+0.7787	8 17 50.02	238	319	.873
17	1.0275	1.2252	9.7662	0.7796	8 13 54.11	239	320	.876
18	1.0163	1.2304	9.7684	0.7804	8 9 58.20	240	321	.879
19	+1.0045	+1.2354	+9.7705	+0.7811	8 6 2.29	241	322	.882
20	0.9924	1.2402	9.7727	0.7819	8 2 6.38	242	323	.884
21	0.9797	1.2448	9.7748	0.7826	7 58 10.47	243	324	.887
22	+0.9665	+1.2493	+9.7770	+0.7833	7 54 14.56	244	325	.890
23	0.9527	1.2536	9.7792	0.7840	7 50 18.65	245	326	
24	0.9383	1.2577	9.7813	0.7847	7 46 22.74	246	327	
25	+0.9233	+1.2616	+9.7835	+0.7853	7 42 26.83	247		
26	0.9076	1.2653	9.7857	0.7859	7 38 30.92			
27	0.8912	1.2689	9.7879	0.7864	7 34 35.01			
28	+0.8740	+1.2724	+9.7901	+0.7870	7 30 39.10			
29	0.8559	1.2756	9.7924	0.7875	7 26 43.19			
30	0.8369	1.2787	9.7946	0.7879	7 22 47.28			
31	+0.8168	+1.2817	+9.7968	+0.7884	7 18 51.37			



## AT APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Sidereal Time of the Semidiam. passing the Meridian.*	Equation of Time, to be subd. from added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>m</sup> <sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Sun.	1	16 29 7.91	10.817	S. 21 48 50.7	22.88	1 10.21	10 46.86	0.334
Mon.	2	16 33 27.52	10.843	21 57 59.8	21.82	1 10.30	10 23.87	0.304
Tues.	3	16 37 47.76	10.868	22 6 43.6	20.75	1 10.39	10 0.26	1.001
Wed.	4	16 42 8.60	10.892	22 15 1.7	19.68	1 10.47	9 36.04	1.333
Thur.	5	16 46 30.02	10.915	22 22 54.0	18.59	1 10.55	9 11.24	1.704
Frid.	6	16 50 51.99	10.937	22 30 20.1	17.48	1 10.62	8 45.90	1.977
Sat.	7	16 55 14.47	10.957	22 37 19.7	16.37	1 10.69	8 20.05	1.997
Sun.	8	16 59 37.44	10.976	22 43 52.7	15.26	1 10.75	7 53.71	1.917
Mon.	9	17 4 0.86	10.993	22 49 58.9	14.13	1 10.81	7 26.91	1.734
Tues.	10	17 8 24.70	11.010	22 55 38.0	12.99	1 10.87	6 59.70	1.530
Wed.	11	17 12 48.94	11.025	23 0 49.8	11.85	1 10.92	6 32.10	1.364
Thur.	12	17 17 13.53	11.038	23 5 34.2	10.70	1 10.97	6 4.14	1.179
Frid.	13	17 21 38.45	11.051	23 9 51.1	9.55	1 11.02	5 35.85	1.191
Sat.	14	17 26 3.68	11.062	23 13 40.2	8.39	1 11.06	5 7.27	1.202
Sun.	15	17 30 29.18	11.072	23 17 1.5	7.22	1 11.10	4 38.41	1.211
Mon.	16	17 34 54.91	11.080	23 19 54.8	6.05	1 11.13	4 9.31	1.221
Tues.	17	17 39 20.84	11.088	23 22 20.1	4.88	1 11.16	3 40.01	1.233
Wed.	18	17 43 46.96	11.095	23 24 17.2	3.71	1 11.18	3 10.52	1.236
Thur.	19	17 48 13.25	11.100	23 25 46.2	2.53	1 11.20	2 40.88	1.240
Frid.	20	17 52 39.65	11.104	23 26 46.9	1.35	1 11.21	2 11.12	1.244
Sat.	21	17 57 6.14	11.106	23 27 19.4	0.18	1 11.22	1 41.27	1.246
Sun.	22	18 1 32.68	11.107	23 27 23.6	1.00	1 11.22	1 11.37	1.247
Mon.	23	18 5 59.25	11.107	23 26 59.5	2.18	1 11.22	0 41.43	1.247
Tues.	24	18 10 25.83	11.106	23 26 7.1	3.36	1 11.22	0 11.49	1.246
Wed.	25	18 14 52.37	11.103	23 24 46.4	4.54	1 11.21	0 18.41	1.240
Thur.	26	18 19 18.85	11.099	23 22 57.5	5.72	1 11.20	0 48.25	1.233
Frid.	27	18 23 45.23	11.094	23 20 40.3	6.89	1 11.18	1 17.99	1.224
Sat.	28	18 28 11.48	11.087	23 17 55.0	8.05	1 11.15	1 47.60	1.215
Sun.	29	18 32 37.56	11.078	23 14 41.7	9.22	1 11.12	2 17.03	1.210
Mon.	30	18 37 3.42	11.068	23 11 0.4	10.38	1 11.09	2 46.26	1.200
Tues.	31	18 41 29.04	11.056	23 6 51.2	11.54	1 11.05	3 15.25	1.196
Wed.	32	18 45 54.39		S. 23 2 14.3		1 11.01	3 43.96	

\* Mean Time of the Semidiameter passing may be found by subtracting 0.19 from the Sidereal Time.

## AT MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S			Equation of Time, to be added to subt. from Mean Time.	Sidereal Time.
		Apparent Right Ascension.	Apparent Declination.	Semidiam.*		
		h m s	° ' "	' "	m s	h m s
Mon.	1	16 29 9.85	S. 21 48 54.8	16 14.9	10 46.69	16 39 56.54
Tues.	2	16 33 29.39	21 58 3.6	16 15.1	10 23.70	16 43 53.10
Wed.	3	16 37 49.56	22 6 47.1	16 15.2	10 0.09	16 47 49.65
Thurs.	4	16 42 10.34	22 15 4.9	16 15.3	9 35.87	16 51 46.21
Frid.	5	16 46 31.69	22 22 56.8	16 15.5	9 11.08	16 55 42.77
Sat.	6	16 50 53.58	22 30 22.6	16 15.6	8 45.75	16 59 39.33
Sun.	7	16 55 15.99	22 37 22.0	16 15.7	8 19.90	17 3 35.88
Mon.	8	16 59 38.88	22 43 54.7	16 15.8	7 53.56	17 7 32.44
Tues.	9	17 4 2.23	22 50 0.6	16 15.9	7 26.77	17 11 29.00
Wed.	10	17 8 25.99	22 55 39.5	16 16.1	6 59.57	17 15 25.55
Thurs.	11	17 12 50.14	23 0 51.1	16 16.2	6 31.97	17 19 22.11
Frid.	12	17 17 14.65	23 5 35.3	16 16.3	6 4.02	17 23 18.67
Sat.	13	17 21 39.48	23 9 51.9	16 16.4	5 35.74	17 27 15.23
Sun.	14	17 26 4.62	23 13 40.9	16 16.5	5 7.16	17 31 11.78
Mon.	15	17 30 30.03	23 17 2.0	16 16.6	4 38.31	17 35 8.34
Tues.	16	17 34 55.67	23 19 55.2	16 16.7	4 9.22	17 39 4.90
Wed.	17	17 39 21.52	23 22 20.4	16 16.8	3 39.93	17 43 1.46
Thurs.	18	17 43 47.55	23 24 17.4	16 16.8	3 10.46	17 46 58.01
Frid.	19	17 48 13.74	23 25 46.3	16 16.9	2 40.83	17 50 54.57
Sat.	20	17 52 40.05	23 26 47.0	16 16.9	2 11.08	17 54 51.13
Sun.	21	17 57 6.45	23 27 19.4	16 17.0	1 41.24	17 58 47.68
Mon.	22	18 1 32.90	23 27 23.6	16 17.1	1 11.34	18 2 44.24
Tues.	23	18 5 59.38	23 26 59.5	16 17.1	0 41.42	18 6 40.80
Wed.	24	18 10 25.87	23 26 7.1	16 17.1	0 11.49	18 10 37.36
Thurs.	25	18 14 52.32	23 24 46.4	16 17.2	0 18	18 14 33.91
Frid.	26	18 19 18.70	23 22 57.5	16 17.2	0 48	18 18 30.47
Sat.	27	18 23 44.99	23 20 40.5	16 17.2	1 17	18 22 27.03
Sun.	28	18 28 11.15	23 17 55.3	16		
Mon.	29	18 32 37.14	23 14 42.0	16		
Tues.	30	18 37 2.91	23 11 0.9	16		
Wed.	31	18 41 28.44	23 6 51.9	16		
Thurs.	32	18 45 53.70	S. 23 2 15.1			

\* The Semidiameter for Apparent Noon may be



## MEAN TIME.

Day of the Month.	THE SUN'S <i>Apparent</i>		Logarithm of the Radius Vector of the Earth.	THE MOON'S			
	Longitude.	Latitude.		Semidiameter.		Horizontal Parallax.	
	Noon.	Noon.		Noon.	Midnight.	Noon.	Midnight.
1	248 59 52.0	N.0 58	9.9937207	15 33.7	15 29.7	57 6.4	56 51
2	250 0 45.9	0 56	9.9936571	15 25.6	15 21.4	56 36.6	56 21
3	251 1 40.9	0 52	9.9935949	15 17.3	15 13.1	56 6.1	55 51
4	252 2 37.1	0 45	9.9935340	15 9.1	15 5.1	55 36.0	55 21
5	253 3 34.3	0 35	9.9934744	15 1.3	14 57.7	55 7.4	54 54
6	254 4 32.3	0 24	9.9934161	14 54.5	14 51.6	54 42.5	54 31
7	255 5 31.2	N.0 12	9.9933593	14 49.1	14 47.1	54 22.8	54 15
8	256 6 30.9	S.0 01	9.9933041	14 45.6	14 44.7	54 9.8	54 6
9	257 7 31.2	0 14	9.9932505	14 44.5	14 44.9	54 5.7	54 7
10	258 8 32.0	0 27	9.9931989	14 45.9	14 47.7	54 11.2	54 17
11	259 9 33.4	0 38	9.9931493	14 50.3	14 53.5	54 27.1	54 39
12	260 10 35.2	0 47	9.9931018	14 57.5	15 2.1	54 53.6	55 10
13	261 11 37.4	0 53	9.9930565	15 7.4	15 13.2	55 29.9	55 51
14	262 12 40.1	0 57	9.9930135	15 19.6	15 26.3	56 14.6	56 39
15	263 13 43.3	0 58	9.9929729	15 33.3	15 40.4	57 5.0	57 31
16	264 14 46.9	0 56	9.9929349	15 47.6	15 54.7	57 57.5	58 23
17	265 15 50.8	0 50	9.9928995	16 1.4	16 7.7	58 48.1	59 11
18	266 16 55.2	0 42	9.9928669	16 13.4	16 18.3	59 32.0	59 59
19	267 18 0.3	0 32	9.9928371	16 22.4	16 25.5	60 5.1	60 11
20	268 19 5.8	0 20	9.9928102	16 27.7	16 28.7	60 24.5	60 2
21	269 20 11.8	S.0 07	9.9927861	16 28.7	16 27.8	60 28.4	60 2
22	270 21 18.3	N.0 06	9.9927648	16 25.9	16 23.2	60 17.9	60
23	271 22 25.4	0 19	9.9927461	16 19.7	16 15.7	59 55.4	59 4
24	272 23 33.1	0 31	9.9927300	16 11.2	16 6.4	59 24.2	59
25	273 24 41.3	0 42	9.9927163	16 1.4	15 56.2	58 47.9	58 2
26	274 25 50.2	0 50	9.9927048	15 51.0	15 45.8	58 9.9	57 5
27	275 26 59.5	0 55	9.9926956	15 40.7	15 35.8	57 32.2	57 1
28	276 28 9.4	0 57	9.9926885	15 31.1	15 26.5	56 56.8	56 3
29	277 29 19.7	0 57	9.9926834	15 22.1	15 17.8	56 23.7	56
30	278 30 30.2	0 54	9.9926803	15 13.8	15 10.0	55 53.4	55 3
31	279 31 41.0	0 48	9.9926790	15 6.3	15 2.8	55 25.9	55 1
32	280 32 51.9	N.0 40	9.9926794	14 59.5	14 56.5	55 1.1	54 4

## MEAN TIME.

Day of the Week.	Day of the Month.	THE MOON'S					
		Longitude.		Latitude.		Age.	Meridian
		Noon.	Midnight.	Noon.	Midnight.	Noon.	Passage.
		<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>d</sup> <sup>h</sup> <sup>m</sup>	
Sun.	1	222 14 47.9	228 52 44.8	N.5 3 30.6	N.4 58 28.1	27.4	22 51.0
Mon.	2	235 27 24.8	241 58 35.9	4 49 29.0	4 36 46.5	28.4	23 41.2
Tues.	3	248 26 8.5	254 49 55.7	4 20 36.1	4 1 16.3	29.4	♂
Wed.	4	261 9 53.8	267 26 2.7	3 39 6.1	3 14 27.3	0.8	0 31.9
Thur.	5	273 38 26.8	279 47 14.8	2 47 41.3	2 19 10.4	1.8	1 22.6
Frid.	6	285 52 39.7	291 54 58.9	1 49 15.9	1 18 20.0	2.8	2 12.8
Sat.	7	297 54 34.0	303 51 50.3	N.0 46 42.9	N.0 14 44.5	3.8	3 1.6
Sun.	8	309 47 16.5	315 41 24.6	S.0 17 15.9	S.0 48 59.9	4.8	3 48.9
Mon.	9	321 34 49.2	327 28 6.9	1 20 10.4	1 50 30.4	5.8	4 34.4
Tues.	10	333 21 56.2	339 16 56.7	2 19 42.8	2 47 31.8	6.8	5 18.6
Wed.	11	345 13 48.6	351 13 12.4	3 13 41.0	3 37 54.3	7.8	6 1.8
Thur.	12	357 15 48.2	3 22 14.3	3 59 54.7	4 19 25.7	8.8	6 44.8
Frid.	13	9 33 7.4	15 49 0.9	4 36 10.1	4 49 50.7	9.8	7 28.4
Sat.	14	22 10 24.2	28 37 41.8	5 0 10.1	5 6 52.0	10.8	8 13.5
Sun.	15	35 11 11.8	41 51 5.3	5 9 40.7	5 8 22.5	11.8	9 1.0
Mon.	16	48 37 25.1	55 30 5.1	5 2 46.0	4 52 43.3	12.8	9 51.9
Tues.	17	62 28 49.7	69 33 14.3	4 38 11.9	4 19 14.1	13.8	10 46.5
Wed.	18	76 42 45.0	83 56 40.1	3 55 58.7	3 28 41.1	14.8	11 44.7
Thur.	19	91 14 11.3	98 34 25.6	2 57 44.3	2 23 37.6	15.8	12 45.7
Frid.	20	105 56 27.4	113 19 20.7	1 46 56.1	S.1 8 20.2	16.8	13 47.4
Sat.	21	120 42 11.1	128 4 8.0	S.0 28 32.8	N.0 11 40.7	17.8	14 48.1
Sun.	22	135 24 25.8	142 42 24.9	N.0 51 35.4	1 30 28.5	18.8	15 46.1
Mon.	23	149 57 32.5	157 9 22.7	2 7 39.3	2 42 31.9	19.8	16 41.0
Tues.	24	164 17 36.0	171 21 58.6	3 14 34.8	3 43 20.8	20.8	17 33.0
Wed.	25	178 22 22.6	185 18 44.1	4 8 29.3	4 43.3	21.8	18 22.7
Thur.	26	192 11 2.9	198 59 21.5	4 46 50.9	1	22.8	19 11.1
Frid.	27	205 43 44.6	212 24 18.1	5 8 22.4	2	23.8	19 59.1
Sat.	28	219 1 8.6	225 34 23.0	5 12	3	24.8	20 47.3
Sun.	29	232 4 8.3	238 30 30.9	5			21.2
Mon.	30	244 53 37.5	251 13 33.8	4			21.8
Tues.	31	257 30 25.9	263 44 19.5	3			22.1
Wed.	32	269 55 21.0	276 3 37.3	N.3 3			



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
SUNDAY 1.				TUESDAY 3.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	14 43 29.44	S. 10 42 6.5	101.55	0	16 29 38.27	S. 17 26 14.2
1	14 47 37.95	10 52 15.8	100.92	1	16 31 50.12	17 32 34.2
2	14 49 46.53	11 2 21.3	100.30	2	16 34 2.02	17 38 48.5
3	14 51 55.17	11 12 23.1	99.67	3	16 36 13.98	17 44 57.0
4	14 54 3.88	11 22 21.1	99.03	4	16 38 25.99	17 50 59.8
5	14 56 12.66	11 32 15.3	98.37	5	16 40 38.04	17 56 56.7
6	14 58 21.50	11 42 5.5	97.72	6	16 42 50.14	18 2 47.9
7	15 0 30.41	11 51 51.8	97.05	7	16 45 2.29	18 8 33.2
8	15 2 39.39	12 1 34.1	96.37	8	16 47 14.48	18 14 12.6
9	15 4 48.45	12 11 12.3	95.68	9	16 49 26.71	18 19 46.1
10	15 6 57.57	12 20 46.4	95.00	10	16 51 38.97	18 25 13.7
11	15 9 6.77	12 30 16.4	94.28	11	16 53 51.28	18 30 35.4
12	15 11 16.03	12 39 42.1	93.58	12	16 56 3.63	18 35 51.1
13	15 13 25.38	12 49 3.6	92.87	13	16 58 16.01	18 41 0.8
14	15 15 34.80	12 58 20.8	92.15	14	17 0 28.42	18 46 4.5
15	15 17 44.28	13 7 33.7	91.42	15	17 2 40.86	18 51 2.2
16	15 19 53.85	13 16 42.2	90.67	16	17 4 53.32	18 55 53.8
17	15 22 3.49	13 25 46.2	89.92	17	17 7 5.81	19 0 39.4
18	15 24 13.20	13 34 45.7	89.17	18	17 9 18.33	19 5 18.8
19	15 26 22.98	13 43 40.7	88.42	19	17 11 30.86	19 9 52.2
20	15 28 32.85	13 52 31.2	87.63	20	17 13 43.42	19 14 19.5
21	15 30 42.78	14 1 17.0	86.85	21	17 15 55.99	19 18 40.5
22	15 32 52.80	14 9 58.1	86.07	22	17 18 8.57	19 22 55.5
23	15 35 2.88	S. 14 18 34.5	85.28	23	17 20 21.17	S. 19 27 4.2
MONDAY 2.				WEDNESDAY 4.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	15 37 13.05	S. 14 27 6.2	84.48	0	17 22 33.78	S. 19 31 6.8
1	15 39 23.29	14 35 33.1	83.67	1	17 24 46.39	19 35 3.2
2	15 41 33.60	14 43 55.1	82.85	2	17 26 59.01	19 38 53.3
3	15 43 43.99	14 52 12.2	82.03	3	17 29 11.63	19 42 37.2
4	15 45 54.45	15 0 24.4	81.22	4	17 31 24.25	19 46 14.9
5	15 48 4.99	15 8 31.7	80.37	5	17 33 36.87	19 49 46.3
6	15 50 15.59	15 16 33.9	79.53	6	17 35 49.48	19 53 11.4
7	15 52 26.28	15 24 31.1	78.68	7	17 38 2.08	19 56 30.3
8	15 54 37.03	15 32 23.2	77.83	8	17 40 14.68	19 59 42.9
9	15 56 47.85	15 40 10.2	76.97	9	17 42 27.25	20 2 49.3
10	15 58 58.75	15 47 52.0	76.10	10	17 44 39.82	20 5 49.3
11	16 1 9.71	15 55 28.6	75.22	11	17 46 52.36	20 8 43.1
12	16 3 20.75	16 2 59.9	74.35	12	17 49 4.88	20 11 30.5
13	16 5 31.86	16 10 26.0	73.45	13	17 51 17.38	20 14 11.6
14	16 7 43.03	16 17 46.7	72.58	14	17 53 29.85	20 16 46.5
15	16 9 54.27	16 25 2.2	71.67	15	17 55 42.30	20 19 15.0
16	16 12 5.57	16 32 12.2	70.77	16	17 57 54.71	20 21 37.2
17	16 14 16.95	16 39 16.8	69.85	17	18 0 7.09	20 23 53.1
18	16 16 28.38	16 46 15.9	68.93	18	18 2 19.42	20 26 2.6
19	16 18 39.88	16 53 9.5	68.03	19	18 4 31.72	20 28 5.8
20	16 20 51.44	16 59 57.7	67.08	20	18 6 43.98	20 30 2.8
21	16 23 3.06	17 6 40.2	66.17	21	18 8 56.19	20 31 53.3
22	16 25 14.74	17 13 17.2	65.22	22	18 11 8.36	20 33 37.6
23	16 27 26.48	17 19 48.5	64.28	23	18 13 20.47	20 35 15.6
24	16 29 38.27	S. 17 26 14.2		24	18 15 32.53	S. 20 36 47.2



MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

hr.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
THURSDAY 5.				SATURDAY 7.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	18 15 32.53	S. 20 36 47.2	14.22	0	19 59 20.98	S. 19 49 55.4	33.58
1	18 17 44.54	20 38 12.5	13.17	1	20 1 27.60	19 46 33.9	34.48
2	18 19 56.48	20 39 31.5	12.12	2	20 3 34.06	19 43 7.0	35.38
3	18 22 8.37	20 40 44.2	11.07	3	20 5 40.36	19 39 34.7	36.30
4	18 24 20.19	20 41 50.6	10.03	4	20 7 46.51	19 35 56.9	37.17
5	18 26 31.95	20 42 50.8	8.97	5	20 9 52.50	19 32 13.9	38.07
6	18 28 43.63	20 43 44.6	7.93	6	20 11 58.33	19 28 25.5	38.95
7	18 30 55.25	20 44 32.2	6.88	7	20 14 4.01	19 24 31.8	39.83
8	18 33 6.79	20 45 13.5	5.85	8	20 16 9.52	19 20 32.8	40.70
9	18 35 18.25	20 45 48.6	4.80	9	20 18 14.88	19 16 28.6	41.57
0	18 37 29.64	20 46 17.4	3.77	10	20 20 20.07	19 12 19.2	42.42
1	18 39 40.94	20 46 40.0	2.72	11	20 22 25.10	19 8 4.7	43.30
2	18 41 52.16	20 46 56.3	1.70	12	20 24 29.97	19 3 44.9	44.16
3	18 44 3.29	20 47 6.5	0.65	13	20 26 34.68	18 59 20.0	44.98
4	18 46 14.33	20 47 10.4	0.37	14	20 28 39.22	18 54 50.1	45.83
5	18 48 25.28	20 47 8.2	1.40	15	20 30 43.61	18 50 15.1	46.67
6	18 50 36.14	20 46 59.8	2.43	16	20 32 47.82	18 45 35.1	47.52
7	18 52 46.90	20 46 45.2	3.45	17	20 34 51.88	18 40 50.0	48.32
8	18 54 57.56	20 46 24.5	4.48	18	20 36 55.77	18 36 0.1	49.17
9	18 57 8.12	20 45 57.6	5.48	19	20 38 59.49	18 31 5.1	49.97
0	18 59 18.57	20 45 24.7	6.52	20	20 41 3.06	18 26 5.3	50.78
1	19 1 28.92	20 44 45.6	7.53	21	20 43 6.46	18 21 0.6	51.58
2	19 3 39.16	20 44 0.4	8.53	22	20 45 9.69	18 15 51.1	52.40
3	19 5 49.29	S. 20 43 9.2	9.55	23	20 47 12.76	S. 18 10 36.7	53.18
FRIDAY 6.				SUNDAY 8.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	19 7 59.31	S. 20 42 11.9	10.55	0	20 49 15.67	S. 18 5 17.6	53.98
1	19 10 9.21	20 41 8.6	11.57	1	20 51 18.42	17 59 53.7	54.75
2	19 12 19.00	20 39 59.2	12.55	2	20 53 21.00	17 54 25.2	55.55
3	19 14 28.67	20 38 43.9	13.57	3	20 55 23.42	17 48 51.9	56.32
4	19 16 38.22	20 37 22.5	14.53	4	20 57 25.67	17 43 14.0	57.08
5	19 18 47.64	20 35 55.3	15.55	5	20 59 27.77	17 37 31.5	57.85
6	19 20 56.94	20 34 22.0	16.52	6	21 1 29.70	17 31 44.4	58.60
7	19 23 6.11	20 32 42.9	17.50	7	21 3 31.47	17 25 52.8	59.37
8	19 25 15.16	20 30 57.9	18.48	8	21 5 33.08	17 19 56.6	60.12
9	19 27 24.07	20 29 7.0	19.45	9	21 7 34.53	17 13 55.9	60.85
0	19 29 32.85	20 27 10.3	20.43	10	21 9 35.82	17 7 50.8	61.58
1	19 31 41.49	20 25 7.7	21.40	11	21 11 36.95	17 1 41.3	62.32
2	19 33 50.00	20 22 59.3	22.35	12	21 13 37.93	16 55 27.4	63.05
3	19 35 58.37	20 20 45.2	23.32	13	21 15 5	16 49 9.1	63.77
4	19 38 6.61	20 18 25.3	24.28	14	21	16 42 46.5	64.47
5	19 40 14.70	20 15 59.6	25.22	15	2	6 36 19.7	65.20
6	19 42 22.65	20 13 28.3	26.17	16	6	6 29 48.5	65.88
7	19 44 30.46	20 10 51.3	27.12				66.60
8	19 46 38.12	20 8 8.6	28.05				67.28
9	19 48 45.64	20 5 20.3	28.97				67.97
0	19 50 53.00	20 2 26.5	29.92				68.67
1	19 53 0.22	19 59 27.0	30.83	21			
2	19 55 7.29	19 56 22.0	31.77	22			
3	19 57 14.21	19 53 11.4	32.67	23			
4	19 59 20.98	S. 19 49 55.4					



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
MONDAY 9.				WEDNESDAY 11.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	21 37 37.62	S. 15 35 10.1	71.33	0	23 10 40.03	S. 8 47 58.1
1	21 39 36.63	15 28 2.1	71.98	1	23 12 34.37	8 38 16.4
2	21 41 35.49	15 20 50.2	72.63	2	23 14 28.68	8 28 33.1
3	21 43 34.22	15 13 34.4	73.28	3	23 16 22.95	8 18 47.4
4	21 45 32.80	15 6 14.7	73.92	4	23 18 17.19	8 8 59.1
5	21 47 31.24	14 58 51.2	74.57	5	23 20 11.40	7 59 8.4
6	21 49 29.55	14 51 23.8	75.18	6	23 22 5.59	7 49 15.4
7	21 51 27.72	14 43 52.7	75.80	7	23 23 59.75	7 39 20.1
8	21 53 25.76	14 36 17.9	76.43	8	23 25 53.90	7 29 22.4
9	21 55 23.67	14 28 39.3	77.03	9	23 27 48.03	7 19 23.1
10	21 57 21.44	14 20 57.1	77.65	10	23 29 42.14	7 9 21.4
11	21 59 19.08	14 13 11.2	78.25	11	23 31 36.25	6 59 17.4
12	22 1 16.60	14 5 21.7	78.85	12	23 33 30.35	6 49 11.1
13	22 3 13.99	13 57 28.6	79.43	13	23 35 24.44	6 39 2.4
14	22 5 11.26	13 49 32.0	80.03	14	23 37 18.54	6 28 52.7
15	22 7 8.40	13 41 31.8	80.62	15	23 39 12.63	6 18 40.4
16	22 9 5.43	13 33 28.1	81.18	16	23 41 6.73	6 8 26.1
17	22 11 2.34	13 25 21.0	81.75	17	23 43 0.84	5 58 9.5
18	22 12 59.13	13 17 10.5	82.33	18	23 44 54.96	5 47 51.8
19	22 14 55.80	13 8 56.5	82.88	19	23 46 49.10	5 37 31.8
20	22 16 52.37	13 0 39.2	83.43	20	23 48 43.25	5 27 9.9
21	22 18 48.82	12 52 18.6	83.98	21	23 50 37.43	5 16 46.3
22	22 20 45.17	12 43 54.7	84.53	22	23 52 31.62	5 6 20.8
23	22 22 41.41	S. 12 35 27.5	85.07	23	23 54 25.85	S. 4 55 53.6
TUESDAY 10.				THURSDAY 12.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
0	22 24 37.56	S. 12 26 57.1	85.60	0	23 56 20.11	S. 4 45 21.6
1	22 26 33.60	12 18 23.5	86.13	1	23 58 14.40	4 34 54.0
2	22 28 29.54	12 9 46.7	86.65	2	0 0 8.73	4 24 21.7
3	22 30 25.38	12 1 6.8	87.18	3	0 2 3.10	4 13 47.8
4	22 32 21.13	11 52 23.7	87.68	4	0 3 57.51	4 3 12.3
5	22 34 16.79	11 43 37.6	88.18	5	0 5 51.97	3 52 35.3
6	22 36 12.36	11 34 48.5	88.70	6	0 7 46.48	3 41 56.7
7	22 38 7.84	11 25 56.3	89.18	7	0 9 41.05	3 31 16.6
8	22 40 3.23	11 17 1.2	89.70	8	0 11 35.67	3 20 35.1
9	22 41 58.54	11 8 3.0	90.17	9	0 13 30.36	3 9 52.2
10	22 43 53.77	10 59 2.0	90.65	10	0 15 25.11	2 59 8.0
11	22 45 48.93	10 49 58.1	91.13	11	0 17 19.92	2 48 22.3
12	22 47 44.00	10 40 51.3	91.60	12	0 19 14.81	2 37 35.4
13	22 49 39.01	10 31 41.7	92.07	13	0 21 9.77	2 26 47.2
14	22 51 33.94	10 22 29.3	92.53	14	0 23 4.82	2 15 57.7
15	22 53 28.81	10 13 14.1	92.98	15	0 24 59.94	2 5 7.1
16	22 55 23.61	10 3 56.2	93.45	16	0 26 55.15	1 54 15.3
17	22 57 18.35	9 54 35.5	93.88	17	0 28 50.44	1 43 22.3
18	22 59 13.04	9 45 12.2	94.32	18	0 30 45.83	1 32 28.3
19	23 1 7.66	9 35 46.3	94.77	19	0 32 41.31	1 21 33.2
20	23 3 2.23	9 26 17.7	95.18	20	0 34 36.90	1 10 37.1
21	23 4 56.75	9 16 46.6	95.62	21	0 36 32.59	0 59 40.1
22	23 6 51.23	9 7 12.9	96.03	22	0 38 28.38	0 48 42.1
23	23 8 45.65	8 57 36.7	96.45	23	0 40 24.28	0 37 43.2
24	23 10 40.03	S. 8 47 58.0		24	0 42 20.31	S. 0 26 43.4



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

R.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
FRIDAY 13.				SUNDAY 15.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	42 20 31	S. 0 26 43 4	110 10	0	2 18 32 80	N. 8 23 26 8	107 50
1	44 16 45	0 15 42 8	110 22	1	2 20 38 74	8 34 11 8	107 23
2	46 12 70	S. 0 4 41 5	110 35	2	2 22 44 97	8 44 55 2	106 93
3	48 9 08	N. 0 6 20 6	110 48	3	2 24 51 49	8 55 36 8	106 63
4	50 5 59	0 17 23 5	110 57	4	2 26 58 30	9 6 16 6	106 33
5	52 2 23	0 28 26 9	110 68	5	2 29 5 42	9 16 54 6	106 00
6	53 59 00	0 39 31 0	110 77	6	2 31 12 82	9 27 30 6	105 67
7	55 55 91	0 50 35 6	110 87	7	2 33 20 54	9 38 4 6	105 32
8	57 52 97	1 1 40 8	110 95	8	2 35 28 56	9 48 36 5	104 97
9	59 50 17	1 12 46 5	111 02	9	2 37 36 88	9 59 6 3	104 58
10	1 1 47 52	1 23 52 6	111 10	10	2 39 45 52	10 9 33 8	104 22
11	3 45 02	1 34 59 2	111 15	11	2 41 54 47	10 19 59 1	103 82
12	5 42 68	1 46 6 1	111 20	12	2 44 3 73	10 30 22 0	103 42
13	7 40 50	1 57 13 3	111 25	13	2 46 13 32	10 40 42 5	103 00
14	9 38 48	2 8 20 8	111 28	14	2 48 23 22	10 51 0 5	102 57
15	11 36 63	2 19 28 5	111 32	15	2 50 33 45	11 1 15 9	102 13
16	13 34 95	2 30 36 4	111 35	16	2 52 44 01	11 11 28 7	101 68
17	15 33 44	2 41 44 5	111 35	17	2 54 54 90	11 21 38 8	101 22
18	17 32 12	2 52 52 6	111 37	18	2 57 6 12	11 31 46 1	100 75
19	19 30 97	3 4 0 8	111 35	19	2 59 17 67	11 41 50 6	100 25
20	21 30 01	3 15 8 9	111 37	20	3 1 29 56	11 51 52 1	99 75
21	23 29 24	3 26 17 1	111 33	21	3 3 41 78	12 1 50 6	99 23
22	25 28 66	3 37 25 1	111 30	22	3 5 54 35	12 11 46 0	98 72
23	27 28 28	N. 3 48 32 9	111 28	23	3 8 7 26	N. 12 21 38 3	98 17
SATURDAY 14.				MONDAY 16.			
0	1 29 28 10	N. 3 59 40 6	111 23	0	3 10 20 50	N. 12 31 27 3	97 62
1	1 31 28 12	4 10 48 0	111 18	1	3 12 34 09	12 41 13 0	97 07
2	1 33 28 35	4 21 55 1	111 13	2	3 14 48 04	12 50 55 4	96 47
3	1 35 28 79	4 33 1 9	111 05	3	3 17 2 32	13 0 34 2	95 88
4	1 37 29 45	4 44 8 2	110 98	4	3 19 16 97	13 10 9 5	95 28
5	1 39 30 32	4 55 14 1	110 90	5	3 21 31 96	13 19 41 2	94 65
6	1 41 31 41	5 6 19 5	110 80	6	3 23 47 30	13 29 9 1	94 03
7	1 43 32 72	5 17 24 3	110 72	7	3 26 3 01	13 38 33 3	93 38
8	1 45 34 27	5 28 28 6	110 58	8	3 28 19 06	13 47 53 6	92 73
9	1 47 36 04	5 39 32 1	110 47	9	3 30 35 48	13 57 10 0	92 05
10	1 49 38 06	5 50 34 9	110 35	10	3 32 52 25	14 6 22 3	91 37
11	1 51 40 31	6 1 37 0	110 20	11	3 35 9 38	14 15 30 5	90 67
12	1 53 42 80	6 12 38 2	110 05	12	3 37 26 86	14 24 34 5	89 95
13	1 55 45 54	6 23 38 5	109 90	13	3 39 44 71	14 33 34 2	89 23
14	1 57 48 52	6 34 37 9	109 73	14	3 42 2 92	14 42 29 6	88 48
15	1 59 51 76	6 45 36 3	109 55	15	3 44 21 50		87 73
16	2 1 55 26	6 56 33 6	109 37	16	3 46 40 4		86 7
17	2 3 59 01	7 7 29 8	109 18	17	3 48		85 8
18	2 6 3 02	7 18 24 9	108 95	18			
19	2 8 7 30	7 29 18 6	108 75	19			
20	2 10 11 85	7 40 11 1	108 52	20			
21	2 12 16 67	7 51 2 2	108 28	21	3 1		
22	2 14 21 77	8 1 51 9	108 03	22	4		
23	2 16 27 14	8 12 40 1	107 78	23	5		
24	2 18 32 80	N. 8 23 26 8		24	6		



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
<i>TUESDAY 17.</i>				<i>THURSDAY 19.</i>		
0	4 5 24.97	N.16 7 25.1	80.32	0	6 5 16.37	N.20 29 20.1
1	4 7 47.17	16 15 27.0	79.43	1	6 7 52.58	20 31 39.1
2	4 10 9.73	16 23 23.6	78.52	2	6 10 28.95	20 33 49.1
3	4 12 32.65	16 31 14.7	77.60	3	6 13 5.48	20 35 50.1
4	4 14 55.93	16 39 0.3	76.65	4	6 15 42.16	20 37 43.1
5	4 17 19.57	16 46 40.2	75.72	5	6 18 18.99	20 39 27.1
6	4 19 43.56	16 54 14.5	74.75	6	6 20 55.96	20 41 2.1
7	4 22 7.91	17 1 43.0	73.77	7	6 23 33.06	20 42 28.1
8	4 24 32.61	17 9 5.6	72.78	8	6 26 10.29	20 43 45.1
9	4 26 57.66	17 16 22.3	71.78	9	6 28 47.63	20 44 54.1
10	4 29 23.07	17 23 33.0	70.75	10	6 31 25.09	20 45 53.1
11	4 31 48.82	17 30 37.5	69.73	11	6 34 2.64	20 46 44.1
12	4 34 14.91	17 37 35.9	68.68	12	6 36 40.29	20 47 26.1
13	4 36 41.36	17 44 28.0	67.63	13	6 39 18.02	20 47 59.1
14	4 39 8.14	17 51 13.8	66.55	14	6 41 55.84	20 48 22.1
15	4 41 35.27	17 57 53.1	65.47	15	6 44 33.72	20 48 37.1
16	4 44 2.73	18 4 25.9	64.37	16	6 47 11.67	20 48 43.1
17	4 46 30.53	18 10 52.1	63.27	17	6 49 49.67	20 48 40.1
18	4 48 58.65	18 17 11.7	62.13	18	6 52 27.72	20 48 27.8
19	4 51 27.11	18 23 24.5	61.00	19	6 55 5.81	20 48 6.3
20	4 53 55.89	18 29 30.5	59.83	20	6 57 43.93	20 47 36.1
21	4 56 24.99	18 35 29.5	58.68	21	7 0 22.07	20 46 56.7
22	4 58 54.41	18 41 21.6	57.52	22	7 3 0.24	20 46 8.3
23	5 1 24.14	N.18 47 6.7	56.32	23	7 5 38.41	N.20 45 10.8
<i>WEDNESDAY 18.</i>				<i>FRIDAY 20.</i>		
0	5 3 54.18	N.18 52 44.6	55.12	0	7 8 16.58	N.20 44 4.2
1	5 6 24.53	18 58 15.3	53.92	1	7 10 54.75	20 42 48.6
2	5 8 55.19	19 3 38.8	52.68	2	7 13 32.90	20 41 24.0
3	5 11 26.14	19 8 54.9	51.43	3	7 16 11.03	20 39 50.3
4	5 13 57.39	19 14 3.5	50.22	4	7 18 49.13	20 38 7.7
5	5 16 28.93	19 19 4.8	48.93	5	7 21 27.19	20 36 16.1
6	5 19 0.76	19 23 58.4	47.67	6	7 24 5.21	20 34 15.5
7	5 21 32.86	19 28 44.4	46.38	7	7 26 43.18	20 32 6.0
8	5 24 5.24	19 33 22.7	45.10	8	7 29 21.08	20 29 47.5
9	5 26 37.89	19 37 53.3	43.78	9	7 31 58.92	20 27 20.1
10	5 29 10.81	19 42 16.0	42.48	10	7 34 36.69	20 24 43.8
11	5 31 43.99	19 46 30.9	41.15	11	7 37 14.37	20 21 58.7
12	5 34 17.41	19 50 37.8	39.82	12	7 39 51.97	20 19 4.7
13	5 36 51.09	19 54 36.7	38.48	13	7 42 29.47	20 16 1.9
14	5 39 25.02	19 58 27.6	37.12	14	7 45 6.86	20 12 50.4
15	5 41 59.19	20 2 10.3	35.75	15	7 47 44.14	20 9 30.1
16	5 44 33.58	20 5 44.8	34.38	16	7 50 21.31	20 6 1.2
17	5 47 8.20	20 9 11.1	33.02	17	7 52 58.35	20 2 23.5
18	5 49 43.05	20 12 29.2	31.62	18	7 55 35.26	19 58 37.3
19	5 52 18.10	20 15 38.9	30.22	19	7 58 12.04	19 54 42.4
20	5 54 53.37	20 18 40.2	28.80	20	8 0 48.66	19 50 39.0
21	5 57 28.83	20 21 33.0	27.40	21	8 3 25.15	19 46 27.2
22	6 0 4.49	20 24 17.4	25.98	22	8 6 1.47	19 42 6.8
23	6 2 40.34	20 26 53.3	24.55	23	8 8 37.63	19 37 38.1
24	6 5 16.37	N.20 29 20.6		24	8 11 13.63	N.19 33 1.0



MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

r.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SATURDAY 21.				MONDAY 23.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
	8 11 13.63	N. 19 33 1.0	47.57	0	10 11 17.45	N. 13 29 7.2	100.17
	8 13 49.45	19 28 15.6	48.95	1	10 13 40.56	13 19 6.2	100.95
	8 16 25.09	19 23 21.9	50.30	2	10 16 3.37	13 9 0.5	101.67
	8 19 0.54	19 18 20.1	51.67	3	10 18 25.89	12 58 50.5	102.42
	8 21 35.80	19 13 10.1	53.02	4	10 20 48.10	12 48 36.0	103.13
	8 24 10.86	19 7 52.0	54.35	5	10 23 10.02	12 38 17.2	103.83
	8 26 45.72	19 2 25.9	55.68	6	10 25 31.65	12 27 54.2	104.52
	8 29 20.37	18 56 51.8	56.98	7	10 27 52.98	12 17 27.1	105.18
	8 31 54.81	18 51 9.9	58.32	8	10 30 14.02	12 6 56.0	105.87
	8 34 29.04	18 45 20.0	59.59	9	10 32 34.76	11 56 20.8	106.48
	8 37 3.04	18 39 22.5	60.88	10	10 34 55.22	11 45 41.9	107.13
	8 39 36.81	18 33 17.2	62.17	11	10 37 15.38	11 34 59.1	107.75
	8 42 10.35	18 27 4.2	63.42	12	10 39 35.26	11 24 12.6	108.35
	8 44 43.66	18 20 43.7	64.67	13	10 41 54.85	11 13 22.5	108.93
	8 47 16.72	18 14 15.7	65.92	14	10 44 14.16	11 2 28.9	109.52
	8 49 49.54	18 7 40.2	67.13	15	10 46 33.19	10 51 31.8	110.07
	8 52 22.11	18 0 57.4	68.35	16	10 48 51.94	10 40 31.4	110.62
	8 54 54.44	17 54 7.3	69.57	17	10 51 10.40	10 29 27.7	111.15
	8 57 26.50	17 47 9.9	70.73	18	10 53 28.60	10 18 20.8	111.67
	8 59 58.31	17 40 5.5	71.93	19	10 55 46.51	10 7 10.8	112.17
	9 2 29.85	17 32 53.9	73.08	20	10 58 4.16	9 55 57.8	112.67
	9 5 1.13	17 25 35.4	74.23	21	11 0 21.54	9 44 41.8	113.15
	9 7 32.15	17 18 10.0	75.38	22	11 2 38.65	9 33 22.9	113.60
	9 10 2.89	N. 17 10 37.7	76.52	23	11 4 55.49	N. 9 22 1.3	114.07
SUNDAY 22.				TUESDAY 24.			
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
	9 12 33.34	N. 17 2 58.6	77.62	0	11 7 12.06	N. 9 10 36.9	114.50
	9 15 3.53	16 55 12.9	78.73	1	11 9 28.38	8 59 9.9	114.92
	9 17 33.44	16 47 20.5	79.80	2	11 11 44.43	8 47 40.4	115.33
	9 20 3.06	16 39 21.7	80.88	3	11 14 0.24	8 36 8.4	115.73
	9 22 32.41	16 31 16.4	81.93	4	11 16 15.79	8 24 34.0	116.12
	9 25 1.46	16 23 4.8	82.98	5	11 18 31.09	8 12 57.3	116.48
	9 27 30.23	16 14 46.9	84.03	6	11 20 46.14	8 1 18.4	116.83
	9 29 58.71	16 6 22.7	85.03	7	11 23 0.94	7 49 37.4	117.18
	9 32 26.90	15 57 52.5	86.03	8	11 25 15.51	7 37 54.3	117.52
	9 34 54.79	15 49 16.3	87.03	9	11 27 29.84	7 26 9.2	117.83
	9 37 22.40	15 40 34.1	88.02	10	11 29 43.93	7 14 22.2	118.13
	9 39 49.70	15 31 46.0	88.97	11	11 31 57.79	7 2 33.4	118.43
	9 42 16.71	15 22 52.2	89.92	12	11 34 11.41	6 50 42.8	118.70
	9 44 43.42	15 13 52.7	90.85	13	11 36 24.81	6 38 50.6	118.98
	9 47 9.83	15 4 47.6	91.78	14	11 38 37.99	6 26 56.7	119.23
	9 49 35.95	14 55 36.9	92.67	15	11 40 50.95	6 15	
	9 52 1.76	14 46 20.9	93.57	16	11 43 3.70	6	
	9 54 27.27	14 36 59.5	94.45	17	11 45 16.82	5	
	9 56 52.48	14 27 32.8	95.32	18			
	9 59 17.40	14 18 0.9	96.15	19			
	10 1 42.01	14 8 24.0	96.98	20			
	10 4 6.32	13 58 42.1	97.80	21			
	10 6 30.33	13 48 55.3	98.62	22			
	10 8 54.04	13 39 3.6	99.40	23			
	10 11 17.45	N. 13 29 7.2		24			



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.
WEDNESDAY 25.				FRIDAY 27.		
0	<sup>h</sup> <sup>m</sup> <sup>s</sup> 12 0 38.19	<sup>°</sup> <sup>'</sup> <sup>"</sup> N. 4 26 46.5	<sup>"</sup> 121.10	0	<sup>h</sup> <sup>m</sup> <sup>s</sup> 13 42 54.07	<sup>°</sup> <sup>'</sup> <sup>"</sup> S. 5 9 34
1	12 2 49.12	4 14 39.9	121.22	1	13 45 0.00	5 21 5
2	12 4 59.87	4 2 32.6	121.35	2	13 47 5.90	5 32 33
3	12 7 10.43	3 50 24.5	121.43	3	13 49 11.78	5 43 59
4	12 9 20.82	3 38 15.9	121.52	4	13 51 17.64	5 55 22
5	12 11 31.03	3 26 6.8	121.60	5	13 53 23.48	6 6 44
6	12 13 41.07	3 13 57.2	121.65	6	13 55 29.32	6 18 3
7	12 15 50.95	3 1 47.3	121.72	7	13 57 35.14	6 29 19
8	12 18 0.65	2 49 37.0	121.77	8	13 59 40.95	6 40 33
9	12 20 10.20	2 37 26.4	121.78	9	14 1 46.76	6 51 45
10	12 22 19.59	2 25 15.7	121.82	10	14 3 52.57	7 2 54
11	12 24 28.83	2 13 4.8	121.82	11	14 5 58.38	7 14 0
12	12 26 37.91	2 0 53.9	121.82	12	14 8 4.20	7 25 4
13	12 28 46.85	1 48 43.0	121.82	13	14 10 10.02	7 36 5
14	12 30 55.65	1 36 32.1	121.80	14	14 12 15.85	7 47 3
15	12 33 4.31	1 24 21.3	121.75	15	14 14 21.68	7 57 59
16	12 35 12.83	1 12 10.8	121.70	16	14 16 27.54	8 8 51
17	12 37 21.22	1 0 0.6	121.65	17	14 18 33.40	8 19 41
18	12 39 29.48	0 47 50.7	121.58	18	14 20 39.29	8 30 27
19	12 41 37.61	0 35 41.2	121.52	19	14 22 45.20	8 41 11
20	12 43 45.62	0 23 32.1	121.42	20	14 24 51.13	8 51 51
21	12 45 53.52	N. 0 11 23.6	121.33	21	14 26 57.09	9 2 29
22	12 48 1.29	S. 0 0 44.4	121.22	22	14 29 3.07	9 13 3
23	12 50 8.96	S. 0 12 51.7	121.10	23	14 31 9.08	S. 9 23 34
THURSDAY 26.				SATURDAY 28.		
0	12 52 16.51	S. 0 24 58.3	120.98	0	14 33 15.13	S. 9 34 2
1	12 54 23.96	0 37 4.2	120.83	1	14 35 21.21	9 44 26
2	12 56 31.31	0 49 9.2	120.70	2	14 37 27.33	9 54 48
3	12 58 38.56	1 1 13.4	120.53	3	14 39 33.48	10 5 5
4	13 0 45.72	1 13 16.6	120.37	4	14 41 39.68	10 15 19
5	13 2 52.79	1 25 18.8	120.20	5	14 43 45.92	10 25 30
6	13 4 59.77	1 37 20.0	120.00	6	14 45 52.20	10 35 37
7	13 7 6.66	1 49 20.0	119.82	7	14 47 58.53	10 45 41
8	13 9 13.47	2 1 18.9	119.60	8	14 50 4.90	10 55 41
9	13 11 20.21	2 13 16.5	119.38	9	14 52 11.33	11 5 37
10	13 13 26.87	2 25 12.8	119.17	10	14 54 17.80	11 15 30
11	13 15 33.45	2 37 7.8	118.93	11	14 56 24.33	11 25 19
12	13 17 39.97	2 49 1.4	118.68	12	14 58 30.91	11 35 4
13	13 19 46.42	3 0 53.5	118.43	13	15 0 37.55	11 44 45
14	13 21 52.82	3 12 44.1	118.18	14	15 2 44.25	11 54 23
15	13 23 59.15	3 24 33.2	117.90	15	15 4 51.00	12 3 56
16	13 26 5.43	3 36 20.6	117.62	16	15 6 57.82	12 13 25
17	13 28 11.66	3 48 6.3	117.33	17	15 9 4.69	12 22 51
18	13 30 17.84	3 59 50.3	117.03	18	15 11 11.63	12 32 12
19	13 32 23.97	4 11 32.5	116.73	19	15 13 18.64	12 41 30
20	13 34 30.07	4 23 12.9	116.42	20	15 15 25.71	12 50 43
21	13 36 36.12	4 34 51.4	116.08	21	15 17 32.84	12 59 52
22	13 38 42.13	4 46 27.9	115.75	22	15 19 40.05	13 8 56
23	13 40 48.12	4 58 2.4	115.40	23	15 21 47.32	13 17 57
24	13 42 54.07	S. 5 9 34.8		24	15 23 54.66	S. 13 26 53



## MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .	Hour.	Right Ascension.	Declination.	Diff. Dec. for 10 <sup>m</sup> .
SUNDAY 29.				TUESDAY 31.			
0	15 23 54.66	S. 13 26 53.1	88.62	0	17 7 13.74	S. 18 59 0.0	46.85
1	15 26 2.07	13 35 44.8	87.88	1	17 9 24.50	19 3 41.1	45.87
2	15 28 9.55	13 44 32.1	87.15	2	17 11 35.30	19 8 16.3	44.87
3	15 30 17.11	13 53 15.0	86.40	3	17 13 46.14	19 12 45.5	43.90
4	15 32 24.74	14 1 53.4	85.63	4	17 15 57.02	19 17 8.9	42.88
5	15 34 32.44	14 10 27.2	84.88	5	17 18 7.95	19 21 26.2	41.90
6	15 36 40.21	14 18 56.5	84.13	6	17 20 18.91	19 25 37.6	40.88
7	15 38 48.06	14 27 21.3	83.33	7	17 22 29.91	19 29 42.9	39.90
8	15 40 55.99	14 35 41.3	82.57	8	17 24 40.94	19 33 42.3	38.88
9	15 43 3.99	14 43 56.7	81.78	9	17 26 52.00	19 37 35.6	37.87
10	15 45 12.07	14 52 7.4	81.00	10	17 29 3.09	19 41 22.8	36.87
11	15 47 20.23	15 0 13.4	80.18	11	17 31 14.21	19 45 4.0	35.87
12	15 49 28.46	15 8 14.5	79.38	12	17 33 25.35	19 48 39.2	34.83
13	15 51 36.77	15 16 10.8	78.58	13	17 35 36.51	19 52 8.2	33.83
14	15 53 45.16	15 24 2.3	77.77	14	17 37 47.70	19 55 31.2	32.80
15	15 55 53.62	15 31 48.9	76.93	15	17 39 58.91	19 58 48.0	31.78
16	15 58 2.17	15 39 30.5	76.12	16	17 42 10.13	20 1 58.7	30.77
17	16 0 10.79	15 47 7.2	75.27	17	17 44 21.36	20 5 3.3	29.73
18	16 2 19.49	15 54 38.8	74.43	18	17 46 32.61	20 8 1.7	28.70
19	16 4 28.26	16 2 5.4	73.58	19	17 48 43.87	20 10 53.9	27.68
20	16 6 37.11	16 9 26.9	72.75	20	17 50 55.13	20 13 40.0	26.65
21	16 8 46.04	16 16 43.4	71.87	21	17 53 6.39	20 16 19.9	25.62
22	16 10 55.05	16 23 54.6	71.02	22	17 55 17.66	20 18 53.6	24.60
23	16 13 4.13	S. 16 31 0.7	70.15	23	17 57 28.92	S. 20 21 21.2	23.55
MONDAY 30.				WEDNESDAY, JAN. 1, 1851.			
0	16 15 13.28	S. 16 38 1.6	69.27	0	17 59 40.18	S. 20 23 42.5	
1	16 17 22.51	16 44 57.2	68.40				
2	16 19 31.82	16 51 47.6	67.50				
3	16 21 41.20	16 58 32.6	66.62				
4	16 23 50.65	17 5 12.3	65.72				
5	16 26 0.18	17 11 46.6	64.82				
6	16 28 9.78	17 18 15.5	63.92				
7	16 30 19.45	17 24 39.0	63.00				
8	16 32 29.20	17 30 57.0	62.08				
9	16 34 39.01	17 37 9.5	61.17				
10	16 36 48.89	17 43 16.5	60.23				
11	16 38 58.83	17 49 17.9	59.32				
12	16 41 8.85	17 55 13.8	58.38				
13	16 43 18.93	18 1 4.1	57.43				
14	16 45 29.08	18 6 48.7	56.50				
15	16 47 39.28	18 12 27.7	55.55				
16	16 49 49.55	18 18 1.0	54.60				
17	16 51 59.89	18 23 28.6	53.65				
18	16 54 10.28	18 28 50.5	52.68				
19	16 56 20.72	18 34 6.6	51.72				
20	16 58 31.22	18 39 16.9	50.77				
21	17 0 41.78	18 44 21.5	49.78				
22	17 2 52.38	18 49 20.2	48.80				
23	17 5 3.04	18 54 13.0	47.83				
24	17 7 13.74	S. 18 59 0.0					

## PHASES OF THE MOON.

●	New Moon	-	-	3	5	16	.0
☾	First Quarter	-	-	11	8	36	.7
☾	Full Moon	-	-	18	17	2	.9
☾	Last Quarter	-	-	25	9	23	.6

☾	Apogee	-	-	-	-	8	23
☾	Perigee	-	-	-	-	11	18



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	
		<sup>o</sup> <sup>i</sup> <sup>n</sup>		<sup>o</sup> <sup>i</sup> <sup>n</sup>		<sup>o</sup> <sup>i</sup> <sup>n</sup>		<sup>o</sup>	
5	SUN W.	20 45 43	3345	22 9 3	3345	23 32 23	3347	24 53	
	Fomalhaut E.	61 40 3	3203	60 13 57	3222	58 48 14	3242	57 22	
	α Pegasi E.	77 32 6	3263	76 7 11	3277	74 42 33	3293	73 18	
	Saturn E.	100 44 35	2877	99 11 47	2887	97 39 12	2897	96 6	
6	SUN W.	31 50 55	3376	33 13 39	3382	34 36 16	3389	35 58	
	Fomalhaut E.	50 22 58	3386	49 0 26	3416	47 38 27	3446	46 17	
	α Pegasi E.	66 21 19	3396	64 58 58	3416	63 36 59	3437	62 15	
	Saturn E.	88 27 53	2952	86 56 40	2960	85 25 37	2969	83 54	
	α Arietis E.	109 2 53	3125	107 35 14	3131	106 7 42	3137	104 40	
7	SUN W.	42 49 23	3426	44 11 10	3432	45 32 50	3439	46 54	
	Fomalhaut E.	39 39 54	3682	38 22 48	3733	37 6 36	3791	35 51	
	α Pegasi E.	55 33 41	3578	54 14 43	3607	52 56 16	3636	51 38	
	Saturn E.	76 22 50	3014	74 52 54	3020	73 23 6	3026	71 53	
	α Arietis E.	97 24 58	3172	95 58 15	3178	94 31 39	3183	93 5	
8	SUN W.	53 40 48	3466	55 1 50	3469	56 22 49	3472	57 43	
	α Pegasi E.	45 17 53	3861	44 3 54	3910	42 50 44	3961	41 38	
	Saturn E.	64 26 48	3056	62 57 45	3061	61 28 48	3065	59 59	
	α Arietis E.	85 54 14	3214	84 28 21	3218	83 2 33	3222	81 36	
9	SUN W.	64 27 45	3482	65 48 29	3481	67 9 14	3481	68 29	
	α Pegasi E.	35 52 43	4403	34 47 24	4507	33 43 38	4624	32 41	
	Saturn E.	52 36 18	3077	51 7 40	3078	49 39 4	3078	48 10	
	α Arietis E.	74 29 24	3244	73 4 7	3247	71 38 53	3250	70 13	
	Aldebaran E.	105 54 52	3078	104 26 15	3079	102 57 40	3078	101 29	
10	SUN W.	75 14 9	3469	76 35 8	3464	77 56 12	3460	79 17	
	α Aquilæ W.	45 10 30	4350	46 16 37	4282	47 23 46	4222	48 31	
	Saturn E.	40 47 12	3070	39 18 26	3067	37 49 36	3064	36 20	
	α Arietis E.	63 8 37	3265	61 43 44	3266	60 18 53	3269	58 54	
	Aldebaran E.	94 5 44	3069	92 36 56	3065	91 8 3	3061	89 39	
11	SUN W.	86 4 38	3423	87 26 28	3415	88 48 28	3407	90 10	
	α Aquilæ W.	54 24 51	3930	55 37 40	3892	56 51 8	3854	58 5	
	Saturn E.	28 55 1	3037	27 25 34	3031	25 56 0	3026	24 26	
	α Arietis E.	51 50 49	3286	50 26 21	3289	49 1 57	3295	47 37	
	Aldebaran E.	82 12 47	3028	80 43 9	3020	79 13 21	3013	77 43	
12	SUN W.	97 4 11	3345	98 27 31	3332	99 51 5	3320	101 14	
	α Aquilæ W.	64 24 29	3663	65 41 55	3635	66 59 52	3609	68 18	
	Fomalhaut W.	30 7 9	4068	31 17 42	3962	32 29 59	3868	33 43	
	α Arietis E.	40 38 15	3348	39 14 59	3363	37 52 0	3382	36 29	
	Aldebaran E.	70 10 53	2957	68 39 46	2946	67 8 25	2934	65 36	
	Pollux E.	114 10 15	3007	112 40 11	2994	111 9 51	2981	109 39	
13	SUN W.	108 17 49	3236	109 43 16	3221	111 9 0	3205	112 35	
	α Aquilæ W.	74 57 18	3463	76 18 24	3440	77 39 55	3418	79 1	
	Fomalhaut W.	40 12 45	3463	41 33 51	3413	42 55 53	3365	44 18	
	α Pegasi W.	29 55 27	4826	30 54 42	4635	31 56 37	4467	33 0	
	α Arietis E.	29 44 13	3595	28 25 33	3660	27 8 3	3737	25 51	
	Aldebaran E.	57 54 55	2857	56 21 41	2843	54 48 9	2829	53 14	
	Pollux E.	102 2 10	2901	100 29 52	2886	98 57 15	2871	97 24	



MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>h</sup> .	P. L. of diff.	XVIII <sup>h</sup> .	P. L. of diff.	XXI <sup>h</sup> .	P. L. of diff.
		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>		<sup>o</sup> <sup>i</sup> <sup>"</sup>	
5	SUN W.	26 18 54	3354	27 42 3	3359	29 5 7	3365	30 28 4	3370
	Fomalhaut E.	55 58 2	3286	54 33 34	3309	53 9 33	3334	51 46 1	3359
	α Pegasi E.	71 54 11	3325	70 30 28	3342	69 7 5	3359	67 44 2	3377
	Saturn E.	94 34 39	2916	93 2 40	2925	91 30 53	2934	89 59 17	2943
6	SUN W.	37 21 8	3402	38 43 22	3408	40 5 30	3415	41 27 30	3421
	Fomalhaut E.	44 56 14	3513	43 36 4	3551	42 16 36	3591	40 57 52	3634
	α Pegasi E.	60 54 12	3479	59 33 24	3503	58 13 3	3526	56 53 8	3552
	Saturn E.	82 24 3	2984	80 53 30	2993	79 23 8	2999	77 52 54	3007
	α Arietis E.	103 12 59	3149	101 45 49	3154	100 18 45	3160	98 51 48	3166
7	SUN W.	48 15 51	3448	49 37 13	3454	50 58 29	3457	52 19 41	3462
	Fomalhaut E.	34 37 18	3924	33 24 22	4002	32 12 44	4089	31 2 32	4188
	α Pegasi E.	50 20 59	3701	49 4 13	3738	47 48 6	3775	46 32 38	3817
	Saturn E.	70 23 53	3038	68 54 27	3043	67 25 8	3048	65 55 55	3053
	α Arietis E.	91 38 46	3194	90 12 29	3199	88 46 18	3204	87 20 13	3209
8	SUN W.	59 4 36	3477	60 25 26	3479	61 46 14	3480	63 7 0	3481
	α Pegasi E.	40 27 4	4081	39 16 44	4150	38 7 30	4226	36 59 28	4308
	Saturn E.	58 31 6	3070	57 2 20	3073	55 33 37	3075	54 4 57	3076
	α Arietis E.	80 11 12	3230	78 45 38	3234	77 20 9	3237	75 54 44	3241
9	SUN W.	69 50 45	3479	71 11 32	3477	72 32 22	3475	73 53 14	3472
	α Pegasi E.	31 41 21	4905	30 43 10	5075	29 47 13	5271	28 53 44	5494
	Saturn E.	46 41 51	3078	45 13 14	3076	43 44 35	3075	42 15 55	3073
	α Arietis E.	68 48 36	3255	67 23 32	3258	65 58 31	3260	64 33 33	3262
	Aldebaran E.	100 0 28	3077	98 31 50	3076	97 3 11	3074	95 34 29	3071
10	SUN W.	80 38 35	3450	81 59 55	3445	83 21 21	3437	84 42 56	3430
	α Aquilæ W.	49 40 50	4111	50 50 41	4063	52 1 19	4016	53 12 43	3971
	Saturn E.	34 51 46	3056	33 22 43	3052	31 53 35	3048	30 24 21	3043
	α Arietis E.	57 29 20	3273	56 4 37	3276	54 39 58	3279	53 15 22	3282
	Aldebaran E.	88 10 3	3052	86 40 55	3046	85 11 39	3041	83 42 17	3035
11	SUN W.	91 32 57	3387	92 55 28	3378	94 18 10	3367	95 41 4	3356
	α Aquilæ W.	59 19 58	3785	60 35 16	3752	61 51 8	3721	63 7 33	3692
	Saturn E.	22 56 30	3013	21 26 33	3008	19 56 30	3002	18 26 19	2997
	α Arietis E.	46 13 28	3307	44 49 25	3314	43 25 30	3324	42 1 46	3335
	Aldebaran E.	76 13 17	2996	74 42 59	2986	73 12 29	2977	71 41 48	2966
12	SUN W.	102 38 56	3294	104 3 15	3281	105 27 49	3265	106 52 41	3252
	α Aquilæ W.	69 37 11	3556	70 56 33	3532	72 16 22	3508	73 36 37	3485
	Fomalhaut W.	34 59 9	3709	36 15 47	3700	37 33 39	3576	38 52 40	3517
	α Arietis E.	35 7 10	3430	33 45 27	3420	32 24 18	3497	31 3 51	3542
	Aldebaran E.	64 4 58	2910			61 0 30	2884	59 27 51	2871
	Pollux E.	108 8 24	2936			105 5 52	2929	103 34 10	2915
13	SUN W.	114 1 24	3175			7 3139		118 22 29	3123
	α Aquilæ W.	80 21 10				3 3338		84 33 27	3319
	Fomalhaut W.	45 42 36				0 3		49 58 40	3166
	α Pegasi W.	34 7 33						17 39 23	3854
	α Arietis E.	24 37 26						1 7 22	4490
	Aldebaran E.	51 40 9						55 39	2752
	Pollux E.	95 51 3						9 17	2793



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	
		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>°</sup> <sup>'</sup> <sup>"</sup>	
14	SUN W.	119 50 11	3105	121 18 15	3087	122 46 40	3069	124 15	
	α Aquilæ W.	85 57 17	3300	87 21 29	3282	88 46 1	3265	90 10	
	Fomalhaut W.	51 25 30	3132	52 53 1	3100	54 21 11	3067	55 50	
	α Pegasi W.	38 53 30	3763	40 9 11	3680	41 26 19	3604	42 44	
	Aldebaran E.	45 20 8	2736	43 44 16	2720	42 8 2	2702	40 31	
	Pollux E.	89 34 40	2777	87 59 42	2760	86 24 22	2744	84 48	
15	SUN W.	131 44 58	2960	133 16 1	2942	134 47 27	2924	136 19	
	α Aquilæ W.	97 19 56	3174	98 46 36	3163	100 13 30	3152	101 40	
	Fomalhaut W.	63 23 17	2898	64 55 39	2872	66 28 34	2847	68 2	
	α Pegasi W.	49 35 15	3247	51 0 29	3200	52 26 38	3154	53 53	
	Saturn W.	21 8 29	2619	22 46 58	2599	24 25 54	2579	26 5	
	Aldebaran E.	32 22 43	2601	30 43 49	2583	29 4 31	2566	27 24	
	Pollux E.	76 44 38	2643	75 6 42	2626	73 28 23	2610	71 49	
16	Fomalhaut W.	75 56 54	2711	77 33 20	2691	79 10 12	2670	80 47	
	α Pegasi W.	61 21 2	2931	62 52 41	2900	64 25 0	2870	65 57	
	Saturn W.	34 28 52	2467	36 10 52	2449	37 53 17	2431	39 36	
	α Arietis W.	19 51 8	4243	20 58 54	3962	22 11 11	3734	23 27	
	Pollux E.	63 30 30	2512	61 49 34	2497	60 8 16	2481	58 26	
	Regulus E.	99 8 15	2460	97 26 5	2442	95 43 30	2425	94 0	
17	Fomalhaut W.	89 0 21	2566	90 40 3	2551	92 20 6	2536	94 0	
	α Pegasi W.	73 51 28	2717	75 27 45	2696	77 4 30	2676	78 41	
	Saturn W.	48 16 18	2332	50 1 31	2317	51 47 5	2302	53 33	
	α Arietis W.	30 31 1	2959	32 2 5	2886	33 34 42	2820	35 8	
	Pollux E.	49 53 24	2402	48 9 52	2391	46 26 4	2380	44 42	
	Regulus E.	85 19 44	2328	83 34 25	2313	81 48 45	2298	80 2	
18	Fomalhaut W.	102 26 40	2470	104 8 36	2462	105 50 43	2455	107 33	
	α Pegasi W.	86 53 39	2579	88 33 3	2567	90 12 44	2556	91 52	
	Saturn W.	62 27 52	2221	64 15 48	2210	66 4 1	2198	67 52	
	α Arietis W.	43 15 51	2546	44 56 0	2515	46 36 53	2486	48 18	
	Aldebaran W.	9 6 22	2242	10 53 47	2223	12 41 40	2208	14 29	
	Pollux E.	35 59 11	2347	34 14 20	2348	32 29 30	2353	30 44	
	Regulus E.	71 7 28	2218	69 19 27	2206	67 31 9	2196	65 42	
19	α Pegasi W.	100 15 12	2515	101 56 5	2514	103 36 59	2512	105 17	
	Saturn W.	76 58 45	2143	78 48 39	2136	80 38 43	2129	82 28	
	α Arietis W.	56 54 40	2356	58 39 18	2341	60 24 18	2326	62 9	
	Aldebaran W.	23 35 48	2143	25 25 42	2135	27 15 48	2128	29 6	
	Regulus E.	56 36 2	2140	54 46 4	2133	52 55 56	2127	51 5	
	Jupiter E.	108 12 47	2189	106 24 3	2181	104 35 7	2174	102 46	
	Spica ♀ E.	110 21 52	2176	108 32 48	2168	106 43 32	2160	104 54	
20	Saturn W.	91 42 7	2103	93 33 2	2101	95 23 59	2100	97 14	
	α Arietis W.	71 0 25	2269	72 47 10	2264	74 34 3	2258	76 21	
	Aldebaran W.	38 19 32	2100	40 10 31	2097	42 1 34	2096	43 52	
	Regulus E.	41 52 13	2101	40 1 16	2099	38 10 16	2098	36 19	
	Jupiter E.	93 38 30	2147	91 48 42	2144	89 58 50	2143	88 8	
	Spica ♀ E.	95 44 41	2132	93 54 30	2129	92 4 15	2128	90 13	
21	Saturn W.	106 30 1	2103	108 20 56	2106	110 11 46	2109	112 2	



## MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P.L. of diff.	XV <sup>h</sup> .	P.L. of diff.	XVIII <sup>h</sup> .	P.L. of diff.	XXI <sup>h</sup> .	P.L. of diff.
14	SUN W.	125 44 36	3034	127 14 7	3016	128 44 0	2996	130 14 18	2978
	α Aquilæ W.	91 36 6	3232	93 1 37	3217	94 27 26	3202	95 53 33	3188
	Fomalhaut W.	57 19 28	3006	58 49 33	2978	60 20 13	2951	61 51 27	2923
	α Pegasi W.	44 4 37	3468	45 25 37	3408	46 47 45	3350	48 10 59	3296
	Aldebaran E.	38 54 27	2669	37 17 5	2652	35 39 21	2635	34 1 14	2618
	Pollux E.	83 12 37	2711	81 36 11	2694	79 59 23	2677	78 22 12	2660
15	SUN W.	137 51 28	2887	139 24 3	2869	140 57 2	2852	142 30 23	2836
	α Aquilæ W.	103 7 58	3132	104 35 29	3123	106 3 11	3117	107 31 0	3111
	Fomalhaut W.	69 36 0	2799	71 10 29	2776	72 45 28	2753	74 20 57	2732
	α Pegasi W.	55 21 36	3073	56 50 19	3035	58 19 49	2998	59 50 4	2964
	Saturn W.	27 45 9	2540	29 25 26	2522	31 6 9	2503	32 47 18	2485
	Aldebaran E.	25 44 44	2532	24 4 15	2515	22 23 22	2499	20 42 7	2482
	Pollux E.	70 10 36	2576	68 31 8	2560	66 51 18	2543	65 11 5	2527
16	Fomalhaut W.	82 25 17	2632	84 3 28	2615	85 42 2	2598	87 21 0	2581
	α Pegasi W.	67 31 32	2815	69 5 41	2788	70 40 25	2763	72 15 41	2740
	Saturn W.	41 19 21	2397	43 3 0	2380	44 47 3	2364	46 31 29	2348
	α Arietis W.	24 46 55	3389	26 9 24	3257	27 34 26	3143	29 1 44	3045
	Pollux E.	56 44 36	2453	55 2 16	2439	53 19 37	2427	51 36 40	2413
	Regulus E.	92 17 9	2391	90 33 22	2375	88 49 12	2360	87 4 40	2344
17	Fomalhaut W.	95 41 11	2510	97 22 10	2499	99 3 25	2487	100 44 56	2478
	α Pegasi W.	80 19 20	2639	81 57 22	2623	83 35 46	2606	85 14 33	2592
	Saturn W.	55 19 19	2273	57 5 58	2260	58 52 57	2247	60 40 15	2234
	α Arietis W.	36 44 3	2709	38 20 31	2662	39 58 2	2620	41 36 30	2581
	Pollux E.	42 57 46	2364	41 13 19	2357	39 28 43	2352	37 43 59	2349
	Regulus E.	78 16 20	2270	76 29 36	2257	74 42 33	2243	72 55 10	2231
18	Fomalhaut W.	109 15 24	2446	110 57 54	2443	112 40 28	2441	114 23 5	2441
	α Pegasi W.	93 32 50	2537	95 13 12	2520	96 53 44	2523	98 34 25	2519
	Saturn W.	69 41 17	2178	71 30 18	2168	73 19 34	2159	75 9 3	2151
	α Arietis W.	50 0 37	2434	51 43 23	2412	53 26 40	2391	55 10 27	2373
	Aldebaran W.	16 18 33	2182	18 7 28	2170	19 56 40	2161	21 46 7	2151
	Pollux E.	29 0 13	2370	27 15 55	2387	25 32 1	2409	23 48 39	2441
	Regulus E.	63 53 45	2175	62 4 40	2165	60 15 20	2157	58 25 47	2149
19	α Pegasi W.	106 58 50	2516	108 39 41	2521	110 20 25	2526	112 1 2	2534
	Saturn W.	84 19 21	2118	86 9 53	2113	88 0 32	2109	89 51 17	2106
	α Arietis W.	63 53 19	2302	65 41 15	2292	67 27 26	2284	69 13 49	2275
	Aldebaran W.	30 56 31	2116	32 47 6	2111	34 37 48	2107	36 28 37	2103
	Regulus E.	49 15 11	2116	47 24 36	2111	45 33 54	2107	43 43 6	2104
	Jupiter E.	100 56 46	2163	99 7 22	2157	97 17 50	2154	95 28 13	2150
	Spica η E.	103 4 27	2142	101 14 41	2143	99 24 47	2139	97 34 47	2135
20	Saturn W.	99 6 1	2099	101 14 41	2099	102 48 4	2100	104 39 4	2101
	α Arietis W.	78 8 0	2224	80 14 15	2221	81 42 29	2250	83 29 42	2251
	Aldebaran W.	45 11 11	2096	47 11 11	2096	49 26 3	2096	51 17 9	2096
	Regulus E.	34 11 11	2100	36 11 11	2100	38 46 7	2100	40 55 7	2102
	Jupiter E.	86 21 11	2142	88 21 11	2142	90 9 21	2142	92 49 14	2144
	Spica η E.	88 21 11	2128	90 21 11	2128	92 2 21	2128	94 52 45	2130
21	Saturn W.	113 21 11	2128	115 21 11	2128	117 21 11	2128	119 21 24	2134



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Noon.	P. L. of diff.	III <sup>h</sup> .	P. L. of diff.	VI <sup>h</sup> .	P. L. of diff.	IX <sup>h</sup> .	
		° ' "		° ' "		° ' "		° ' "	
21	α Arietis W.	85 16 51	2252	87 4 4	2254	88 51 11	2257	90 38	
	Aldebaran W.	53 8 14	2099	54 59 15	2101	56 50 13	2104	58 41	
	Pollux W.	11 54 26	3225	13 20 6	2956	14 51 14	2773	16 26	
	Regulus E.	27 4 11	2105	25 13 19	2109	23 22 33	2113	21 31	
	Jupiter E.	78 59 22	2146	77 9 33	2149	75 19 48	2151	73 30	
	Spica ♀ E.	81 2 31	2132	79 12 20	2135	77 22 14	2138	75 32	
22	α Arietis W.	99 31 39	2291	101 17 51	2300	103 3 50	2310	104 49	
	Aldebaran W.	67 53 53	2134	69 44 1	2140	71 34 0	2147	73 23	
	Pollux W.	24 52 18	2366	26 36 41	2344	28 21 36	2329	30 6	
	Jupiter E.	64 23 28	2182	62 34 34	2190	60 45 51	2196	58 57	
	Spica ♀ E.	66 24 5	2173	64 34 56	2181	62 46 0	2188	60 57	
	Sun E.	134 56 29	2458	133 14 16	2463	131 32 11	2470	129 50	
23	Aldebaran W.	82 29 50	2196	84 18 23	2206	86 6 42	2215	87 54	
	Pollux W.	38 56 7	2300	40 42 7	2302	42 28 3	2305	44 13	
	Jupiter E.	49 57 45	2250	48 10 32	2261	46 23 35	2272	44 36	
	Spica ♀ E.	51 57 12	2252	50 10 1	2264	48 23 8	2276	46 36	
	Sun E.	121 23 26	2521	119 42 42	2530	118 2 10	2540	116 21	
24	Pollux W.	53 1 17	2343	54 46 14	2351	56 31 0	2360	58 15	
	Regulus W.	16 45 31	2294	18 31 40	2301	20 17 38	2311	22 3	
	Jupiter E.	35 47 42	2344	34 2 47	2358	32 18 12	2373	30 33	
	Spica ♀ E.	37 49 8	2371	36 4 52	2391	34 21 4	2411	32 37	
	Sun E.	108 4 9	2607	106 25 23	2618	104 46 52	2630	103 8	
25	Pollux W.	66 54 57	2417	68 38 7	2428	70 21 2	2438	72 3	
	Regulus W.	30 48 21	2373	32 32 34	2385	34 16 31	2396	36 0	
	Spica ♀ E.	24 10 22	2591	22 31 15	2638	20 53 11	2694	19 16	
	Sun E.	95 1 31	2703	93 24 55	2716	91 48 36	2728	90 12	
26	Pollux W.	80 33 14	2504	82 14 22	2515	83 55 15	2525	85 35	
	Regulus W.	44 34 37	2463	46 16 42	2474	47 58 32	2486	49 40	
	Sun E.	82 16 25	2802	80 42 0	2815	79 7 51	2826	77 33	
27	Pollux W.	93 55 15	2591	95 34 22	2602	97 13 15	2613	98 51	
	Regulus W.	58 4 5	2551	59 44 8	2561	61 23 57	2572	63 3	
	Sun E.	69 48 21	2898	68 15 59	2909	66 43 52	2920	65 11	
28	Regulus W.	71 17 54	2632	72 56 6	2642	74 34 4	2651	76 11	
	Jupiter W.	18 51 21	2753	20 26 51	2750	22 2 24	2751	23 37	
	Spica ♀ W.	18 42 32	2953	20 13 44	2916	21 45 43	2888	23 18	
	Sun E.	57 36 5	2986	56 5 35	2997	54 35 19	3007	53 5	
29	Regulus W.	84 17 34	2706	85 54 6	2714	87 30 27	2723	89 6	
	Jupiter W.	31 34 35	2776	33 9 35	2782	34 44 27	2788	36 19	
	Spica ♀ W.	31 5 39	2828	32 39 31	2825	34 13 26	2825	35 47	
	Sun E.	45 38 8	3069	44 9 20	3078	42 40 44	3088	41 12	
30	Regulus W.	97 4 33	2773	98 39 36	2782	100 14 27	2789	101 49	
	Jupiter W.	44 10 37	2829	45 44 27	2836	47 18 8	2843	48 51	
	Spica ♀ W.	43 36 19	2841	45 9 54	2845	46 43 23	2851	48 16	
	Sun E.	33 53 15	3146	32 26 1	3155	30 58 58	3165	29 32	



MEAN TIME.									
LUNAR DISTANCES.									
Day of the Month.	Star's Name and Position.	Midnight.	P. L. of diff.	XV <sup>b</sup> .	P. L. of diff.	XVIII <sup>b</sup> .	P. L. of diff.	XXI <sup>b</sup> .	P. L. of diff.
21	α Arietis W.	92 25 11	2266	94 12 1	2270	95 58 44	2277	97 45 17	2285
	Aldebaran W.	60 31 54	2112	62 22 35	2117	64 13 9	2122	66 3 35	2127
	Pollux W.	18 4 12	2552	19 44 13	2484	21 25 49	2434	23 8 36	2395
	Regulus E.	19 41 22	2125	17 51 1	2133	16 0 52	2142	14 10 57	2154
	Jupiter E.	71 40 33	2160	69 51 5	2165	68 1 44	2170	66 12 31	2176
	Spica ♏ E.	73 42 19	2147	71 52 32	2153	70 2 53	2159	68 13 24	2166
22	α Arietis W.	106 35 5	2331	108 20 19	2343	110 5 16	2355	111 49 55	2369
	Aldebaran W.	75 13 25	2162	77 2 50	2170	78 52 3	2179	80 41 3	2187
	Pollux W.	31 52 28	2309	33 38 14	2304	35 24 8	2300	37 10 7	2300
	Jupiter E.	57 8 57	2213	55 20 49	2222	53 32 54	2231	51 45 13	2240
	Spica ♏ E.	59 8 45	2207	57 20 28	2218	55 32 27	2228	53 44 41	2239
	SUN E.	128 8 31	2485	126 26 57	2493	124 45 34	2502	123 4 24	2511
23	Aldebaran W.	89 42 37	2235	91 30 12	2245	93 17 32	2257	95 4 35	2267
	Pollux W.	45 59 40	2315	47 45 18	2320	49 30 48	2328	51 16 7	2334
	Jupiter E.	42 50 29	2294	41 4 20	2306	39 18 29	2319	37 32 57	2331
	Spica ♏ E.	44 50 20	2305	43 4 28	2320	41 18 57	2336	39 33 50	2353
	SUN E.	114 41 50	2561	113 2 2	2572	111 22 29	2583	109 43 11	2595
24	Pollux W.	59 59 54	2377	61 44 1	2387	63 27 54	2397	65 11 33	2408
	Regulus W.	23 48 52	2330	25 34 7	2341	27 19 7	2351	29 3 52	2362
	Jupiter E.	28 50 6	2403	27 6 36	2420	25 23 30	2438	23 40 50	2458
	Spica ♏ E.	30 54 59	2459	29 12 48	2486	27 31 15	2517	25 50 25	2551
	SUN E.	101 30 40	2654	99 52 58	2666	98 15 33	2678	96 38 24	2690
25	Pollux W.	73 46 7	2460	75 28 16	2470	77 10 11	2482	78 51 50	2492
	Regulus W.	37 43 37	2418	39 26 46	2429	41 9 39	2441	42 52 16	2452
	Spica ♏ E.	17 41 6	2849	16 7 41	2961	14 36 39	3112	13 8 44	3321
	SUN E.	88 36 47	2753	87 1 17	2766	85 26 4	2778	83 51 7	2789
26	Pollux W.	87 16 16	2548	88 56 23	2559	90 36 15	2569	92 15 52	2580
	Regulus W.	51 21 24	2508	53 2 26	2518	54 43 14	2529	56 23 47	2540
	SUN E.	76 0 19	2851	74 26 57	2863	72 53 50	2874	71 20 58	2886
27	Pollux W.	100 30 16	2635	102 8 24	2645	103 46 18	2655	105 23 58	2666
	Regulus W.	64 42 51	2592	66 21 57	2602	68 0 49	2612	69 39 28	2621
	SUN E.	63 40 20	2943	62 8 56	2954	60 37 45	2965	59 6 48	2976
28	Regulus W.	77 49 24	2669	79 26 45	2679	81 3 53	2688	82 40 49	2696
	Jupiter W.	25 13 26	2756	26 48 52	2760	28 24 13	2764	29 59 28	2770
	Spica ♏ W.	24 51 16	2853	26 24 35	2843	27 58 7	2835	29 31 50	2830
	SUN E.	51 35 25	3028	5 47	3038	48 36 21	3049	47 7 9	3058
29	Regulus W.	90 42 33	2740	92 20	2749	93 53 55	2757	95 29 20	2766
	Jupiter W.	37 53 46	2801	38 12	2808	41 2 29	2815	42 36 38	2822
	Spica ♏ W.	37 21 15	2894	3 7	2831	40 28 55	2833	42 2 40	2838
	SUN E.	39 44 7	3100	7	3117	36 48 18	3126	35 20 40	3137
30	Regulus W.	103		106 32 12	2813	106 32 12	2821	108 6 12	2828
	Jupiter W.	50		53 31 21	2872	53 31 21	2872	55 4 16	2879
	Spica ♏ W.	49 50		2 56 14	2871	2 56 14	2871	54 29 10	2877
	SUN E.	28 5 1		12 44	3204	12 44	3204	23 46 40	3216



# CONFIGURATIONS OF THE SATELLITES OF JUPITER

At 17<sup>h</sup> 30<sup>m</sup>, MEAN TIME.

Day of the Month.	West.	East.
1	.2 .4	○ .1 3*
2	1*	○ .2 .4
3	3*	○ .1 2* .4
4	.3 .1 .2	○ .4
5	.3 .2	○ 1*
6	.1	○ .3 .2
7		○ 1* 2* .3 4*
8	.1 ● 2*	○ 3* 4*
9	.2 ● 1*	○ 3* 4*
10	3*	○ .1 2*
11	3* 4* .1 2*	○
12	4* .3 .2	○ 1*
13	4* .1	○ .3 .2
14	.4	○ 1* 2* .3
15	.4 2*	○ 3*
16	.4 1*	○ 3*
17	.4 3*	○ .1 2*
18	3* 1* .4 2*	○
19	.3 .2	○ .4 1*
20	.1 .3	○ .2 .4
21		○ 1* 2* .3 .4
22	2* .1	○ 3*
23	1* ○	.2 ○ 3*
24		3* ○ .1 .2 4*
25	2* ○ 3*	1* ○ 4*
26	.3 .2	○ .1 4*
27	.1 .3 4*	○ .2
28	4*	○ 1* 2* .3
29	4* 2* .1	○ 3*
30	4* .2	○ 1* .3
31	.4 3*	○ .2

This Table represents, at 17<sup>h</sup> 30<sup>m</sup> after *Mean Noon* of each day of the month, the relative positions of the images of Jupiter and his Satellites, as they would appear (disregarding their latitudes) in an inverting telescope. Jupiter is indicated by the white circles (○) in the centre of the configurations of the Satellites by points. The numerals 1, 2, 3, and 4, annexed to the points, serve to distinguish the Satellites from each other; and their positions are such as to indicate the directions of their motions, which are in all cases to be considered as *towards the numerals*. When a Satellite is at its greatest elongation, the point is placed above or below the centre of the numeral. A circle (○) at the left or right hand of the page, denotes that the Satellite placed by the side of the disc of Jupiter, and a black circle (●) that it is either *behind the disc*, or *in the shadow* of Jupiter.

## ECLIPSES OF THE SATELLITES OF JUPITER.

SATELLITE.	Day of the Month.	Mean Time.	Sidereal Time.	PHASE as seen in an inverting Telescope.
I.		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	
	1	13 4 29.5	5 46 34.9	Im.
	3	7 32 51.4	0 21 55.4	Im.
	5	2 1 18.9	18 57 21.6	Im.
	6	20 29 38.1	13 32 39.4	Im.
	8†	14 58 4.7	8 8 4.7	Im.
	10	9 26 25.6	2 43 24.2	Im.
	12	3 54 52.2	21 18 49.4	Im.
	13	22 23 10.6	15 54 6.5	Im.
	15*	16 51 36.1	10 29 30.6	Im. i *
	17	11 19 56.1	5 4 49.2	Im.
	19	5 48 21.9	23 40 13.7	Im.
	21	0 16 39.6	18 15 30.1	Im.
	22*	18 45 4.3	12 50 53.3	Im.
	24	13 13 23.5	7 26 11.2	Im.
	26	7 41 48.6	2 1 35.0	Im.
	28	2 10 5.8	20 36 50.7	Im.
	29	20 38 29.5	15 12 13.1	Im.
	31*	15 6 48.3	9 47 30.5	Im.
II.	2	11 59 32.6	4 45 23.9	Im.
	6	1 15 59.2	18 15 51.0	Im.
	9†	14 32 26.8	7 46 19.1	Im. i *
	13	3 48 53.2	21 16 46.0	Im.
	16*	17 5 20.8	10 47 14.1	Im.
	20	6 21 47.3	0 17 41.1	Im.
	23†	19 38 15.8	13 48 10.2	Im.
	27	8 54 43.6	3 18 38.5	Im.
	30	22 11 13.1	16 49 8.5	Im.
III.	6	6 0 59.8	23 1 38.5	Im.
	6	8 44 4.6	1 45 10.0	Em.
	13	9 59 24.1	3 28 17.8	Im. i *
	13	12 41 35.9	6 10 56.2	Em. e *
	20†	13 57 7.6	7 54 16.3	Im.
	20*	16 38 24.6	10 35 59.7	Em.
	27*	17 54 44.4	12 20 7.9	Im.
	27	20 35 7.3	15 17.2	Em.



APPROXIMATE SIDEREAL TIMES  
OF THE  
OCCULTATIONS OF JUPITER'S SATELLITES BY JUPITER,  
AND OF THE  
TRANSITS OF THE SATELLITES AND THEIR SHADOWS  
OVER THE DISC OF THE PLANET.

Satellite.	OCCULTATIONS.		TRANSITS OF SATELLITES.		TRANSITS OF SHAD	
	Immersion.	Emersion.	Ingress.	Egress.	Ingress.	Eg
	d h m	d h m	d h m	d h m	d h m	d
I.		1* 8 58	2 4 0	2 6 15	2 3 0	2
		3 3 35	4 22 36	4 0 51	4 21 35	4 2
		5 22 11	6 17 13	6 19 27	5 16 11	6 1
		6 16 48	7* 11 49	7 14 4	7* 10 46	7† 1
		8* 11 24	9 6 25	9* 8 40	9 5 21	9†
	In	10 6 0	11 1 2	11 3 16	11 23 56	11
		12 0 37	13 19 38	13 21 52	13 18 32	13 2
		14 19 13	14 14 14	14 16 28	14† 13 7	14 1
	the	15 13 49	16* 8 50	16* 11 4	16† 7 42	16*
		17† 8 25	18 3 26	18 5 40	18 2 17	18
		19 3 1	20 22 2	20 0 16	20 20 53	20 2
		21 21 37	21 16 38	22 18 52	21 15 28	21 1
		22 16 13	23* 11 14	23† 13 28	23* 10 3	23* 1
	Shadow.	24* 10 49	25 5 50	25† 8 4	25 4 38	25
		26 5 25	27 0 25	27 2 39	27 23 13	27
		28 0 1	29 19 1	29 21 15	28 17 48	29 2
		30 18 37	30* 13 37	30 15 50	30* 12 24	30† 1
		31* 13 12				
II.		2* 9 23	4 1 36	4 4 19	4 23 36	4
		6 22 58	7 15 13	8 17 56	7 13 9	7 1
	In	9† 12 32	11 4 48	11 7 31	11 2 40	11
		13 2 7	15 18 25	15 21 7	14 16 12	15 1
	the	16 15 41	18† 7 59	18* 10 41	18 5 44	18†
		20 5 14	22 21 35	22 0 16	22 19 16	22 2
	Shadow.	24 18 47	25* 11 9	25† 13 50	25* 8 47	25* 1
		27† 8 20	29 0 43	29 3 24	29 22 19	29
III.		6 3 10	2 12 40	2 15 29	2* 8 35	2* 1
		13† 7 53	10 17 23	10 20 10	9† 13 0	9 1
		20* 12 34	17 22 5	17 0 49	16 17 26	17 2
		27 17 10	24 2 43	24 5 24	24 21 52	24
			31 7 18	31* 9 56	31 2 17	31

Day of the Month.	For correcting the Places of the Fixed Stars.				Mean Time of Transit of the First Point of Aries.	Mean Equinoctial Time, adding 0 <sup>h</sup> 62 <sup>m</sup> 57 <sup>s</sup> . Days.	From Mean Noon of January 1.	
	At Mean Midnight,						Day of the Year.	Fraction of the Year.
	Logarithm of							
	A	B	C	D				
1	+0.8168	+1.2817	+9.7968	+0.7884	7 18 51.37	253	334	.914
2	0.7957	1.2845	9.7990	0.7888	7 14 55.46	254	335	.917
3	0.7733	1.2871	9.8012	0.7891	7 10 59.55	255	336	.920
4	+0.7495	+1.2896	+9.8035	+0.7894	7 7 3.63	256	337	.923
5	0.7242	1.2920	9.8057	0.7897	7 3 7.72	257	338	.925
6	0.6972	1.2942	9.8079	0.7899	6 59 11.81	258	339	.928
7	+0.6683	+1.2962	+9.8102	+0.7901	6 55 15.90	259	340	.931
8	0.6371	1.2981	9.8124	0.7903	6 51 19.99	260	341	.934
9	0.6033	1.2999	9.8146	0.7904	6 47 24.08	261	342	.936
10	+0.5666	+1.3015	+9.8169	+0.7904	6 43 28.17	262	343	.939
11	0.5263	1.3030	9.8191	0.7905	6 39 32.26	263	344	.942
12	0.4817	1.3043	9.8213	0.7904	6 35 36.34	264	345	.945
13	+0.4319	+1.3055	+9.8235	+0.7903	6 31 40.43	265	346	.947
14	0.3754	1.3066	9.8257	0.7902	6 27 44.52	266	347	.950
15	0.3104	1.3075	9.8279	0.7901	6 23 48.61	267	348	.953
16	+0.2336	+1.3083	+9.8301	+0.7899	6 19 52.70	268	349	.956
17	0.1401	1.3089	9.8323	0.7896	6 15 56.79	269	350	.958
18	0.0206	1.3094	9.8345	0.7893	6 12 0.88	270	351	.961
19	+9.8550	+1.3098	+9.8367	+0.7889	6 8 4.96	271	352	.964
20	9.5836	1.3100	9.8389	0.7885	6 4 9.05	272	353	.966
21	+8.7025	1.3101	9.8410	0.7880	6 0 13.14	273	354	.969
22	-9.4512	+1.3100	+9.8432	+0.7875	5 56 17.23	274	355	.972
23	9.7893	1.3099	9.8453	0.7870	5 52 21.32	275	356	.975
24	9.9770	1.3095	9.8474	0.7864	5 48 25.41	276	357	.977
25	-0.1075	+1.3091	+9.8495	+0.7857	5 44 29.50	277	358	.980
26	0.2077	1.3085	9.8516	0.7850	5 40 33.58	278	359	.983
27	0.2889	1.3077	9.8537	0.7842	5 36 37.67	279	360	.986
28	-0.3572	+1.3069	+9.8558	+0.7834	5 32 41.76	280	361	.988
29	0.4161	1.3058	9.8578	0.7826	5 28 45.85	281	362	.991
30	0.4678	1.3047	9.8599	0.7817	5 24 49.94	282	363	
31	0.5139	1.3034	9.8619	0.7807	5 20 54.03	283		
32	-0.5554	+1.3019	+9.8639	+0.7797	5 16			



# 266 OBLIQUITY OF THE ECLIPTIC,

1850.	Apparent Obliquity.	The Sun's		Equation of Equinoxes.		M Lat
		Horizontal Parallax.	Aberration.	In Long.	In A. R. (in time.)	
Jan. 1	23° 27' 23.73"	8.72"	— 20.77"	— 9.36"	— 0.57"	146
11	23.86	8.72	20.76	9.12	0.56	145
21	24.05	8.71	20.74	8.98	0.55	145
31	23 27 24.28	8.70	20.71	8.98	0.55	144
Feb. 10	24.51	8.69	20.68	9.13	0.56	144
20	24.72	8.67	20.64	9.43	0.58	143
March 2	23 27 24.90	8.65	20.59	9.86	0.60	143
12	25.03	8.63	20.54	10.38	0.63	142
22	25.09	8.60	20.48	10.93	0.67	141
April 1	23 27 25.09	8.58	20.42	11.48	0.70	141
11	25.03	8.55	20.36	11.97	0.73	140
21	24.93	8.53	20.31	12.35	0.76	140
May 1	23 27 24.80	8.51	20.25	12.61	0.77	139
11	24.66	8.49	20.21	12.72	0.78	139
21	24.54	8.47	20.17	12.70	0.78	139
31	23 27 24.44	8.46	20.13	12.55	0.77	139
June 10	24.39	8.45	20.11	12.31	0.75	139
20	24.40	8.44	20.09	12.02	0.74	139
30	23 27 24.47	8.44	20.09	11.73	0.72	139
July 10	24.60	8.44	20.10	11.47	0.70	139
20	24.78	8.44	20.11	11.29	0.69	139
30	23 27 24.99	8.45	20.12	11.22	0.69	139
Aug. 9	25.22	8.46	20.15	11.29	0.69	139
19	25.45	8.48	20.19	11.49	0.70	139
29	23 27 25.65	8.50	20.23	11.82	0.72	139
Sept. 8	25.82	8.52	20.28	12.26	0.75	139
18	25.93	8.54	20.34	12.77	0.78	139
28	23 27 25.98	8.57	20.39	13.31	0.81	139
Oct. 8	25.98	8.59	20.45	13.81	0.85	139
18	25.91	8.62	20.51	14.25	0.87	139
28	23 27 25.80	8.64	20.57	14.58	0.89	139
Nov. 7	25.67	8.66	20.62	14.76	0.90	129
17	25.54	8.68	20.68	14.79	0.90	129
27	23 27 25.43	8.70	20.70	14.67	0.90	128
Dec. 7	25.36	8.71	20.73	14.43	0.88	128
17	25.35	8.72	20.75	14.11	0.86	127
27	23 27 25.41	8.72	20.77	13.77	0.84	127
37	23 27 25.54	8.72	— 20.77	— 13.44	— 0.82	126
Mean Obliquity, Jan. 1, 1850 = 23° 27' 31.95".						Daily

# SUN'S CO-ORDINATES, 1850. 267

Day of the Month.	X	Y	Z
Jan. 1	+0 1842853	-0 8859984	-0 3844450
2	0 2014354	0 8828598	0 3830831
3	0 2185240	0 8794470	0 3816028
4	0 2355458	0 8757612	0 3800035
5	0 2524961	0 8718030	0 3782861
6	0 2693695	0 8675734	0 3764507
7	0 2861605	0 8630728	0 3744979
8	0 3028640	0 8583024	0 3724279
9	0 3194742	0 8532644	0 3702419
10	0 3359857	0 8479592	0 3679399
11	0 3523931	0 8423890	0 3655234
12	0 3686909	0 8365554	0 3629921
13	0 3848741	0 8304600	0 3603473
14	0 4009365	0 8241052	0 3575898
15	0 4168732	0 8174934	0 3547208
16	0 4326792	0 8106260	0 3517414
17	0 4483492	0 8035064	0 3486521
18	0 4638788	0 7961369	0 3454544
19	0 4792624	0 7885197	0 3421493
20	0 4944958	0 7806580	0 3387381
21	0 5095737	0 7725556	0 3352226
22	0 5244931	0 7642137	0 3316030
23	0 5392485	0 7556360	0 3278810
24	0 5538361	0 7468255	0 3240581
25	0 5682513	0 7377852	0 3201353
26	0 5824904	0 7285173	0 3161143
27	0 5965497	0 7190253	0 3119955
28	0 6104250	0 7093125	0 3077810
29	0 6241129	0 6993808	0 3034715
30	0 6376086	0 6892335	0 2990688
31	0 6509091	0 6788735	0 2945734
Feb. 1	0 6640095	0 6683040	0 2899872
2	0 6769062	0 6575280	0 2853113
3	0 6895955	0 6465484	0 2805471
4	0 7020738	0 6353684	0 2756963
5	0 7143362	0 6239916	0 2707597
6	0 7263793	0 6124206	0 2657389
7	0 7381990	0 6006600	0 2606357
8	0 7497915	0 5887128	0 2554520
9	0 7611530	0 5765825	0 2501886
10	0 7722795	0 5642739	0 2448476
11	0 7831678	0 5517904	0 2394308
12	0 7938142	0 5391355	0 2339400
13	0	0 5263154	0 2283771
14	0	0 5133332	0 2227440
15	0 4993312	0 5002000	0 2170422
16	+0 4851302	0 4869168	-0 2112740



# 268 SUN'S CO-ORDINATES, 1850.

Day of the Month.	X	Y	Z
Feb. 16	+0 '8339168	-0 '4868997	-0 '2112740
17	0 '8433070	0 '4734579	0 '2054415
18	0 '8524374	0 '4598724	0 '1995467
19	0 '8613060	0 '4461473	0 '1935910
20	0 '8699108	0 '4322873	0 '1875770
21	0 '8782490	0 '4182966	0 '1815061
22	0 '8863196	0 '4041791	0 '1753805
23	0 '8941194	0 '3899399	0 '1692019
24	0 '9016476	0 '3755833	0 '1629723
25	0 '9089018	0 '3611136	0 '1566937
26	0 '9158804	0 '3465352	0 '1503678
27	0 '9225822	0 '3318520	0 '1439967
28	0 '9290046	0 '3170676	0 '1375815
March 1	0 '9351472	0 '3021868	0 '1311243
2	0 '9410070	0 '2872134	0 '1246272
3	0 '9465824	0 '2721528	0 '1180921
4	0 '9518724	0 '2570087	0 '1115208
5	0 '9568750	0 '2417854	0 '1049152
6	0 '9615890	0 '2264878	0 '0982771
7	0 '9660117	0 '2111200	0 '0916090
8	0 '9701427	0 '1956874	0 '0849125
9	0 '9739804	0 '1801937	0 '0781896
10	0 '9775232	0 '1646442	0 '0714423
11	0 '9807704	0 '1490443	0 '0646732
12	0 '9837211	0 '1333986	0 '0578812
13	0 '9863738	0 '1177125	0 '0510777
14	0 '9887283	0 '1019905	0 '0442557
15	0 '9907840	0 '0862383	0 '0374205
16	0 '9925415	0 '0704605	0 '0305742
17	0 '9939993	0 '0546626	0 '0237192
18	0 '9951581	0 '0388492	0 '0168574
19	0 '9960180	0 '0230255	0 '0099912
20	0 '9965795	-0 '0071968	-0 '0031228
21	0 '9968430	+0 '0086326	+0 '0037459
22	0 '9968086	0 '0244585	0 '0106130
23	0 '9964778	0 '0402758	0 '0174765
24	0 '9958510	0 '0560793	0 '0243339
25	0 '9949284	0 '0718654	0 '0311838
26	0 '9937112	0 '0876298	0 '0380243
27	0 '9921998	0 '1033672	0 '0448530
28	0 '9903955	0 '1190742	0 '0516686
29	0 '9882986	0 '1347456	0 '0584688
30	0 '9859100	0 '1503778	0 '0652518
31	0 '9832304	0 '1659666	0 '0720162
April 1	0 '9802604	0 '1815068	0 '0787594
2	0 '9770015	0 '1969952	0 '0854801
3	+0 '9734542	+0 '2124268	+0 '0921762

# SUN'S CO-ORDINATES, 1850.

269

Day of the Month.	X	Y	Z
April 3	+0° 9734542	+0° 2124268	+0° 0921762
4	0° 9696191	0° 2277969	0° 0988456
5	0° 9654978	0° 2431015	0° 1054865
6	0° 9610909	0° 2583359	0° 1120971
7	0° 9564000	0° 2734952	0° 1186750
8	0° 9514262	0° 2885748	0° 1252183
9	0° 9461709	0° 3035707	0° 1317252
10	0° 9406361	0° 3184770	0° 1381933
11	0° 9348234	0° 3332898	0° 1446208
12	0° 9287349	0° 3480047	0° 1510059
13	0° 9223726	0° 3626174	0° 1573467
14	0° 9157394	0° 3771223	0° 1636406
15	0° 9088372	0° 3915157	0° 1698862
16	0° 9016686	0° 4057932	0° 1760814
17	0° 8942366	0° 4199504	0° 1822245
18	0° 8865436	0° 4339841	0° 1883140
19	0° 8785922	0° 4478896	0° 1943479
20	0° 8703860	0° 4616631	0° 2003242
21	0° 8619274	0° 4753014	0° 2062421
22	0° 8532194	0° 4888002	0° 2120994
23	0° 8442650	0° 5021565	0° 2178950
24	0° 8350671	0° 5153670	0° 2236273
25	0° 8256284	0° 5284280	0° 2292947
26	0° 8159520	0° 5413366	0° 2348960
27	0° 8060404	0° 5540888	0° 2404293
28	0° 7958964	0° 5666818	0° 2458934
29	0° 7855229	0° 5791118	0° 2512871
30	0° 7749226	0° 5913761	0° 2566087
May 1	0° 7640986	0° 6034708	0° 2618568
2	0° 7530541	0° 6153927	0° 2670299
3	0° 7417914	0° 6271387	0° 2721268
4	0° 7303137	0° 6387054	0° 2771457
5	0° 7186245	0° 6500894	0° 2820851
6	0° 7067270	0° 6612866	0° 2869438
7	0° 6946253	0° 6722936	0° 2917199
8	0° 6823219	0° 6831080	0° 2964123
9	0° 6698206	0° 6937255	0° 3010193
10	0° 6571256	0° 7041429	0° 3055398
11	0° 6442406	0° 7143	0° 3099724
12	0° 6311704	0° 7243	0° 3143151
13	0° 6179187	0° 73	0° 3185675
14	0° 6044890		27281
15	0° 5908864		7958
16	0° 5771150		695
17	0° 5631800		80
18	0° 5490853		
19	+0° 5348350		



Day of the Month.	X	Y	Z
May 19	+0 5348350	+0 7884354	+0 342115
20	0 5204335	0 7967029	0 345702
21	0 5058854	0 8047427	0 349191
22	0 4911947	0 8125538	0 352580
23	0 4763653	0 8201336	0 355861
24	0 4614021	0 8274806	0 359057
25	0 4463090	0 8345932	0 362143
26	0 4310895	0 8414698	0 365127
27	0 4157481	0 8481086	0 368008
28	0 4002893	0 8545080	0 370784
29	0 3847162	0 8606658	0 373457
30	0 3690342	0 8665810	0 376023
31	0 3532460	0 8722518	0 378483
June 1	0 3373565	0 8776764	0 380837
2	0 3213701	0 8828530	0 383083
3	0 3052912	0 8877798	0 385221
4	0 2891238	0 8924560	0 387250
5	0 2728732	0 8968792	0 389169
6	0 2565437	0 9010476	0 390978
7	0 2401402	0 9049606	0 392676
8	0 2236674	0 9086167	0 394263
9	0 2071310	0 9120144	0 395737
10	0 1905357	0 9151530	0 397099
11	0 1738863	0 9180316	0 398348
12	0 1571876	0 9206494	0 399484
13	0 1404453	0 9230060	0 400506
14	0 1236642	0 9251009	0 401415
15	0 1068499	0 9269336	0 402211
16	0 0900068	0 9285039	0 402892
17	0 0731394	0 9298120	0 403459
18	0 0562536	0 9308578	0 403913
19	0 0393534	0 9316414	0 404253
20	0 0224432	0 9321629	0 404480
21	+0 0055285	0 9324227	0 404592
22	-0 0113870	0 9324204	0 404591
23	0 0282988	0 9321572	0 404477
24	0 0452016	0 9316330	0 404250
25	0 0620915	0 9308479	0 403909
26	0 0789647	0 9298020	0 403455
27	0 0958163	0 9284952	0 402888
28	0 1126415	0 9269284	0 402209
29	0 1294369	0 9251014	0 401416
30	0 1461971	0 9230150	0 400511
July 1	0 1629178	0 9206687	0 399493
2	0 1795945	0 9180632	0 398362
3	0 1962217	0 9151986	0 397119
4	-0 2127957	+0 9120762	+0 395764

# SUN'S CO-ORDINATES, 1850.

271

Day of the Month.	X	Y	Z
July 4	-0.2127957	+0.9120762	+0.3957647
5	0.2293105	0.9086962	0.3942980
6	0.2457620	0.9050586	0.3927196
7	0.2621449	0.9011646	0.3910305
8	0.2784546	0.8970158	0.3892303
9	0.2946849	0.8926128	0.3873197
10	0.3108326	0.8879568	0.3852994
11	0.3268919	0.8830494	0.3831700
12	0.3428573	0.8778926	0.3809324
13	0.3587249	0.8724872	0.3785870
14	0.3744902	0.8668354	0.3761349
15	0.3901481	0.8609390	0.3735763
16	0.4056947	0.8548000	0.3709125
17	0.4211249	0.8484208	0.3681445
18	0.4364357	0.8418028	0.3652728
19	0.4516214	0.8349482	0.3622991
20	0.4666787	0.8278602	0.3592234
21	0.4816038	0.8205400	0.3560471
22	0.4963936	0.8129892	0.3527706
23	0.5110428	0.8052107	0.3493954
24	0.5255485	0.7972060	0.3459224
25	0.5399071	0.7889770	0.3423518
26	0.5541140	0.7805264	0.3386849
27	0.5681655	0.7718559	0.3349226
28	0.5820583	0.7629676	0.3310658
29	0.5957880	0.7538635	0.3271158
30	0.6093501	0.7445465	0.3230730
31	0.6227419	0.7350175	0.3189381
Aug. 1	0.6359587	0.7252795	0.3147127
2	0.6489963	0.7153350	0.3103980
3	0.6618502	0.7051867	0.3059944
4	0.6745170	0.6948368	0.3015034
5	0.6869930	0.6842882	0.2969261
6	0.6992735	0.6735439	0.2922640
7	0.7113549	0.6626070	0.2875185
8	0.7232332	0.6514809	0.2826908
9	0.7349047	0.6401687	0.2777822
10	0.7463657	0.6286736	0.2727943
11	0.7576125	0.6169996	0.2677290
12	0.7686425	0.6051496	0.2625870
13	0.7794515		0.2573707
14	0.7900375		0.2520813
15	0.80039		0.2467207
16	0.81054		0.2412899
17	0.82041		0.2357908
18	0.830		0.2302253
19	-0.830		0.224594



Day of the Month.	X	Y	Z
Aug. 19	-0° 8395142	+0° 5175924	+0° 2245944
20	0° 8487006	0° 5044692	0° 2189003
21	0° 8576449	0° 4912028	0° 2131437
22	0° 8663450	0° 4777972	0° 2073261
23	0° 8747986	0° 4642554	0° 2014507
24	0° 8830026	0° 4505810	0° 1955171
25	0° 8909554	0° 4367784	0° 1895281
26	0° 8986538	0° 4228494	0° 1834831
27	0° 9060958	0° 4087985	0° 1773861
28	0° 9132786	0° 3946299	0° 1712381
29	0° 9201996	0° 3803462	0° 1650411
30	0° 9268564	0° 3659519	0° 1587951
31	0° 9332472	0° 3514510	0° 1525021
Sept. 1	0° 9393696	0° 3368472	0° 1461651
2	0° 9452207	0° 3221450	0° 1397861
3	0° 9507980	0° 3073481	0° 1333651
4	0° 9561002	0° 2924611	0° 1269051
5	0° 9611249	0° 2774886	0° 1204081
6	0° 9658700	0° 2624348	0° 1138761
7	0° 9703335	0° 2473047	0° 1073111
8	0° 9745147	0° 2321027	0° 1007141
9	0° 9784110	0° 2168343	0° 0940891
10	0° 9820227	0° 2015027	0° 0874361
11	0° 9853475	0° 1861142	0° 0807591
12	0° 9883850	0° 1706718	0° 0740581
13	0° 9911342	0° 1551816	0° 0673337
14	0° 9935945	0° 1396477	0° 0605961
15	0° 9957650	0° 1240746	0° 0538391
16	0° 9976455	0° 1084670	0° 0470661
17	0° 9992355	0° 0928290	0° 0402801
18	1° 0005348	0° 0771653	0° 0334831
19	1° 0015430	0° 0614798	0° 0266771
20	1° 0022593	0° 0457769	0° 0198631
21	1° 0026838	0° 0300609	0° 0130441
22	1° 0028161	+0° 0143360	+0° 0062201
23	1° 0026559	-0° 0013931	-0° 0006041
24	1° 0022030	0° 0171224	0° 0074291
25	1° 0014567	0° 0328476	0° 0142531
26	1° 0004171	0° 0485652	0° 0210731
27	0° 9990835	0° 0642691	0° 0278871
28	0° 9974562	0° 0799554	0° 0346941
29	0° 9955344	0° 0956201	0° 0414911
30	0° 9933185	0° 1112579	0° 0482771
Oct. 1	0° 9908087	0° 1268646	0° 0550491
2	0° 9880052	0° 1424341	0° 0618051
3	0° 9849081	0° 1579627	0° 0685431
4	-0° 9815172	-0° 1734453	-0° 0752621

# SUN'S CO-ORDINATES, 1850. 273

Day of the Month.		X	Y	Z
Oct.	4	—0° 9815172	—0° 1734453	—0° 0752623
	5	0° 9778342	0° 1888772	0° 0819585
	6	0° 9738595	0° 2042525	0° 0886302
	7	0° 9695944	0° 2195666	0° 0952754
	8	0° 9650396	0° 2348144	0° 1018918
	9	0° 9601964	0° 2499917	0° 1084776
	10	0° 9550669	0° 2650937	0° 1150307
	11	0° 9496524	0° 2801147	0° 1215487
	12	0° 9439544	0° 2950513	0° 1280301
	13	0° 9379752	0° 3098979	0° 1344722
	14	0° 9317164	0° 3246506	0° 1408738
	15	0° 9251798	0° 3393051	0° 1472327
	16	0° 9183674	0° 3538569	0° 1535471
	17	0° 9112818	0° 3683022	0° 1598153
	18	0° 9039248	0° 3826365	0° 1660353
	19	0° 8962982	0° 3968556	0° 1722053
	20	0° 8884038	0° 4109562	0° 1783239
	21	0° 8802442	0° 4249341	0° 1843893
	22	0° 8718216	0° 4387851	0° 1903996
	23	0° 8631372	0° 4525052	0° 1963530
	24	0° 8541942	0° 4660901	0° 2022476
	25	0° 8449940	0° 4795357	0° 2080819
	26	0° 8355388	0° 4928384	0° 2138543
	27	0° 8258308	0° 5059937	0° 2195627
	28	0° 8158728	0° 5189976	0° 2252054
	29	0° 8056672	0° 5318455	0° 2307804
	30	0° 7952164	0° 5445339	0° 2362862
	31	0° 7845234	0° 5570576	0° 2417206
Nov.	1	0° 7735910	0° 5694134	0° 2470820
	2	0° 7624223	0° 5815964	0° 2523682
	3	0° 7510202	0° 5936027	0° 2575780
	4	0° 7393890	0° 6054274	0° 2627090
	5	0° 7275317	0° 6170671	0° 2677598
	6	0° 7154522	0° 6285180	0° 2727286
	7	0° 7031540	0° 6397760	0° 2776137
	8	0° 6906413	0° 6508382	0° 2824138
	9	0° 6779178	0° 6617002	0° 2871267
	10	0° 6649883	0° 672	0° 2917517
	11	0° 6518563	0° 68	0° 2962872
	12	0° 6385266	0° 69	0° 3007317
	13	0° 6250027		0° 30837
	14	0° 6112893		0° 3121
	15	0° 5973905		0° 3157
	16	0° 5833107		0° 31
	17	0° 5690527		
	18	0° 5546214		
	19	—0° 5400211		



# 274 SUN'S CO-ORDINATES, 1850.

Day of the Month.	X	Y	Z
Nov. 19	—0°5400211	—0°7586345	—0°3291882
20	0°5252560	0°7670977	0°3328606
21	0°5103301	0°7753265	0°3364313
22	0°4952477	0°7833182	0°3398990
23	0°4800126	0°7910702	0°3432628
24	0°4646290	0°7985800	0°3465214
25	0°4491016	0°8058450	0°3496734
26	0°4334347	0°8128626	0°3527186
27	0°4176323	0°8196306	0°3556553
28	0°4016994	0°8261460	0°3584826
29	0°3856410	0°8324066	0°3611991
30	0°3694622	0°8384102	0°3638041
Dec. 1	0°3531675	0°8441540	0°3662965
2	0°3367626	0°8496362	0°3686754
3	0°3202525	0°8548544	0°3709396
4	0°3036424	0°8598068	0°3730886
5	0°2869379	0°8644916	0°3751214
6	0°2701450	0°8689070	0°3770373
7	0°2532683	0°8730518	0°3788359
8	0°2363135	0°8769250	0°3805166
9	0°2192867	0°8805252	0°3820788
10	0°2021935	0°8838516	0°3835217
11	0°1850389	0°8869032	0°3848458
12	0°1678286	0°8896798	0°3860505
13	0°1505683	0°8921798	0°3871354
14	0°1332624	0°8944032	0°3881002
15	0°1159162	0°8963494	0°3889446
16	0°0985353	0°8980178	0°3896686
17	0°0811255	0°8994084	0°3902725
18	0°0636909	0°9005208	0°3907553
19	0°0462359	0°9013550	0°3911173
20	0°0287669	0°9019106	0°3913584
21	—0°0112886	0°9021870	0°3914783
22	+0°0061936	0°9021844	0°3914771
23	0°0236752	0°9019018	0°3913546
24	0°0411510	0°9013398	0°3911106
25	0°0586151	0°9004974	0°3907451
26	0°0760633	0°8993748	0°3902580
27	0°0934889	0°8979724	0°3896495
28	0°1108876	0°8962896	0°3889193
29	0°1282530	0°8943274	0°3880678
30	0°1455791	0°8920856	0°3870951
31	0°1628609	0°8895652	0°3860020
32	+0°1800922	—0°8867666	—0°3847875

**EPHEMERIS**  
**OF**  
**THE PLANETS.**



## JANUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	R
	Noon.	Noon.	Noon.		Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	19 21 33.97	S. 24 16 50.7	0.1384649	0 38.5	306 51 13.5	S. 6 54 19.5	9
2	19 28 40.83	24 3 12.2	.1352615	0 41.7	310 14 30.1	6 57 44.6	
3	19 35 46.69	23 47 58.7	.1317928	0 44.9	313 42 29.2	6 59 44.7	
4	19 42 51.18	23 31 10.1	.1280455	0 48.0	317 15 30.7	7 0 13.1	
5	19 49 53.93	23 12 46.4	.1240052	0 51.1	320 53 56.1	6 59 2.7	
6	19 56 54.52	22 52 48.2	.1196558	0 54.2	324 38 6.9	6 56 6.0	
7	20 3 52.42	22 31 16.4	.1149804	0 57.2	328 28 25.2	6 51 15.0	
8	20 10 47.12	22 8 12.2	.1099608	1 0.2	332 25 13.2	6 44 21.3	
9	20 17 37.98	21 43 37.4	.1045776	1 3.1	336 28 53.6	6 35 16.3	
10	20 24 24.30	21 17 34.2	.0988103	1 5.9	340 39 49.0	6 23 51.3	
11	20 31 5.26	20 50 5.9	.0926374	1 8.7	344 58 20.8	6 9 57.7	
12	20 37 39.99	20 21 16.0	.0860369	1 11.3	349 24 50.6	5 53 27.3	
13	20 44 7.45	19 51 9.5	.0789856	1 13.8	353 59 37.9	5 34 12.6	
14	20 50 26.47	19 19 52.1	.0714613	1 16.2	358 42 59.9	5 12 7.1	
15	20 56 35.77	18 47 30.8	.0634426	1 18.4	3 35 11.6	4 47 6.3	
16	21 2 33.81	18 14 14.2	.0549084	1 20.4	8 36 23.3	4 19 7.6	
17	21 8 18.97	17 40 12.3	.0458401	1 22.2	13 46 42.2	3 48 11.7	
18	21 13 49.37	17 5 37.0	.0362232	1 23.7	19 6 8.3	3 14 22.9	
19	21 19 2.92	16 30 41.9	.0260486	1 25.0	24 34 35.5	2 37 49.7	
20	21 23 57.37	15 55 42.9	.0153138	1 26.0	30 11 48.9	1 58 46.2	
21	21 28 30.22	15 20 57.7	0.0040255	1 26.5	35 57 25.1	1 17 31.6	
22	21 32 38.85	14 46 46.5	9.9922021	1 26.7	41 50 50.7	S. 0 34 31.4	
23	21 36 20.45	14 13 31.4	.9798751	1 26.4	47 51 22.0	N. 0 9 43.8	
24	21 39 32.11	13 41 36.0	.9670937	1 25.6	53 58 4.5	0 54 37.5	
25	21 42 11.01	13 11 25.9	.9539260	1 24.3	60 9 53.3	1 39 29.5	
26	21 44 14.34	12 43 27.1	.9404607	1 22.4	66 25 34.9	2 23 36.6	
27	21 45 39.58	12 18 6.3	.9268113	1 19.9	72 43 46.5	3 6 14.8	
28	21 46 24.56	11 55 49.1	.9131138	1 16.6	79 3 0.4	3 46 41.4	
29	21 46 27.71	11 36 59.4	.8995271	1 12.7	85 21 47.2	4 24 17.0	
30	21 45 48.20	11 21 58.2	.8862324	1 8.1	91 38 34.6	4 58 27.4	
31	21 44 26.16	11 11 2.0	.8734258	1 2.8	97 51 56.6	5 28 45.0	
32	21 42 22.78	S. 11 4 22.0	9.8613149	0 56.8	104 0 31.0	N. 5 54 50.2	9

## JANUARY, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>"</sup>	<sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	19 21 45.40	+17.84	0.17	S. 24 16 30.0	+32.3	2.3	6.2
2	19 28 53.18	17.81	0.17	24 2 47.0	36.3	2.4	6.3
3	19 35 59.94	17.76	0.17	23 47 28.7	40.3	2.4	6.4
4	19 43 5.30	17.69	0.17	23 30 34.8	44.2	2.4	6.4
5	19 50 8.89	17.61	0.18	23 12 5.5	48.2	2.5	6.5
6	19 57 10.28	17.50	0.18	22 52 1.3	52.1	2.5	6.5
7	20 4 8.94	17.38	0.18	22 30 23.2	56.0	2.5	6.6
8	20 11 4.36	17.23	0.18	22 7 12.4	59.8	2.5	6.7
9	20 17 55.88	17.06	0.18	21 42 30.7	63.6	2.6	6.8
10	20 24 42.79	16.85	0.18	21 16 20.5	67.2	2.6	6.8
11	20 31 24.25	16.60	0.18	20 48 45.2	70.7	2.6	6.9
12	20 37 59.36	16.32	0.18	20 19 48.2	74.0	2.6	7.0
13	20 44 27.09	15.99	0.19	19 49 34.9	77.1	2.7	7.2
14	20 50 46.25	15.60	0.19	19 18 10.9	79.9	2.8	7.3
15	20 56 55.56	15.16	0.19	18 45 43.4	82.4	2.8	7.4
16	21 2 53.44	14.65	0.20	18 12 21.2	84.4	2.9	7.6
17	21 8 38.25	14.07	0.20	17 38 14.5	86.0	2.9	7.7
18	21 14 8.10	13.40	0.21	17 3 35.5	87.1	3.0	7.9
19	21 19 20.87	12.64	0.22	16 28 37.9	87.6	3.1	8.1
20	21 24 14.30	11.79	0.22	15 53 37.7	87.3	3.1	8.3
21	21 28 45.89	10.83	0.22	15 18 53.1	86.3	3.2	8.6
22	21 32 52.99	9.75	0.23	14 44 44.4	84.3	3.3	8.9
23	21 36 32.82	8.55	0.23	14 11 33.9	81.4	3.4	
24	21 39 42.51	7.24	0.24	13 39 45.1	77.5	3.5	
25	21 42 19.25	5.81	0.25	13 9 43.7			
26	21 44 20.28	4.26	0.26	12 41 55.6			
27	21 45 43.15	2.63	0.27	12 16 47.0			
28	21 46 25.78	+0.92	0.27	11 54 43.5			
29	21 46 26.73	-0.84	0.28	11 36 8.2			
30	21 45 45.27	2.61	0.29	11 21 21.6			
31	21 44 21.62	4.35	0.30	11 10 39.3			
32	21 42 17.08	-6.01	0.31	S. 11 4 11.7			



## FEBRUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	L. Ra.
	Noon.	Noon.	Noon.		Noon.	Noon.	
1	21 42 22.78	S. 11 4 22.09	8613149	0 56.8	104 0 31.0	N. 5 54 50.2	9.45
2	21 39 40.52	11 2 2.4	8501098	0 50.1	110 3 2.7	6 16 31.0	34
3	21 36 23.09	11 4 0.2	8400124	0 42.9	115 58 28.8	6 33 43.2	34
4	21 32 35.48	11 10 4.2	8312053	0 35.2	121 45 55.4	6 46 29.7	31
5	21 28 23.70	11 19 55.9	8238402	0 27.1	127 24 42.3	6 54 59.1	31
6	21 23 54.73	11 33 9.8	8180299	0 18.7	132 54 18.7	6 59 25.0	32
7	21 19 15.92	11 49 15.3	8138404	0 10.2	138 14 25.8	7 0 4.1	33
8	21 14 34.88	12 7 38.1	8112886	{ $\frac{1}{2}$ m. 1.4}	143 24 54.1	6 57 15.4	33
9	21 9 58.96	12 27 42.6	8103411	23 44.8	148 25 42.8	6 51 19.2	34
10	21 5 34.85	12 48 53.8	8109229	23 36.8	153 16 58.1	6 42 35.7	35
11	21 1 28.42	13 10 38.9	8129225	23 29.2	157 58 52.8	6 31 25.1	35
12	20 57 44.51	13 32 28.1	8162028	23 22.0	162 31 43.2	6 18 6.4	36
13	20 54 26.82	13 53 56.3	8206105	23 15.2	166 55 49.8	6 2 57.5	37
14	20 51 37.94	14 14 42.5	8259870	23 9.0	171 11 36.0	5 46 14.7	37
15	20 49 19.52	14 34 29.6	8321742	23 3.3	175 19 25.7	5 28 13.1	38
16	20 47 32.29	14 53 4.6	8390228	22 58.1	179 19 44.6	5 9 5.9	39
17	20 46 16.24	15 10 17.8	8463945	22 53.4	183 12 58.5	4 49 5.2	39
18	20 45 30.80	15 26 2.0	8541654	22 49.1	186 59 33.4	4 28 21.5	40
19	20 45 15.00	15 40 12.2	8622266	22 45.4	190 39 54.6	4 7 3.8	40
20	20 45 27.51	15 52 45.5	8704843	22 42.1	194 14 27.2	3 45 20.4	41
21	20 46 6.88	16 3 40.1	8788591	22 39.2	197 43 35.3	3 23 18.1	41
22	20 47 11.52	16 12 54.8	8872843	22 36.7	201 7 42.3	3 1 3.1	42
23	20 48 39.74	16 20 29.6	8957050	22 34.6	204 27 10.4	2 38 40.7	42
24	20 50 29.96	16 26 24.9	9040774	22 32.8	207 42 21.1	2 16 15.4	43
25	20 52 40.55	16 30 41.3	9123666	22 31.4	210 53 35.3	1 53 50.9	43
26	20 55 9.98	16 33 19.5	9205436	22 30.2	214 1 12.2	1 31 30.9	44
27	20 57 56.80	16 34 20.7	9285872	22 29.3	217 5 30.4	1 9 18.1	44
28	21 0 59.66	16 33 45.9	9364803	22 28.6	220 6 48.1	0 47 15.0	44
29	21 4 17.29	S. 16 31 36.3	9442120	22 28.1	223 5 22.3	N. 0 25 23.8	9.63
30	21 42 22.78						

## FEBRUARY, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
1	<sup>h</sup> 21 <sup>m</sup> 42 <sup>s</sup> 17.08	— 6.01	0.31	S. 11° 4' 11".7	+ 10.8	4.5	11.8
2	21 39 34.19	7.54	0.31	11 2 2.3	0.0	4.6	12.2
3	21 36 16.69	8.88	0.32	11 4 7.6	— 10.4	4.7	12.5
4	21 32 29.57	10.00	0.33	11 10 16.1	20.2	4.8	12.7
5	21 28 18.76	10.85	0.34	11 20 9.1	29.1	4.9	12.9
6	21 23 51.14	11.40	0.34	11 33 21.3	36.8	4.9	13.1
7	21 19 13.93	11.65	0.34	11 49 22.5	43.1	5.0	13.2
8	<sup>{</sup> 21 <sup>14</sup> 34 <sup>37</sup> <sup>}</sup>	<sup>{</sup> 11 <sup>38</sup> <sup>}</sup>	<sup>{</sup> 0.34 <sup>}</sup>	<sup>{</sup> 12 <sup>2</sup> 30 <sup>4</sup> <sup>}</sup>	<sup>{</sup> 48 <sup>0</sup> <sup>}</sup>	<sup>{</sup> 5.0 <sup>}</sup>	<sup>{</sup> 13.2 <sup>}</sup>
9	21 5 37.56	10.62	0.34	12 48 40.2	53.6	5.0	13.3
10	21 1 32.24	9.79	0.34	13 10 17.8	54.4	5.0	13.2
11	20 57 49.05	8.78	0.34	13 32 0.2	54.0	4.9	13.1
12	20 54 31.69	7.65	0.34	13 53 22.7	52.7	4.9	13.0
13	20 51 42.74	6.42	0.33	14 14 4.6	50.6	4.8	12.8
14	20 49 23.89	5.14	0.33	14 33 48.7	47.9	4.8	12.6
15	20 47 35.92	3.85	0.32	14 52 22.2	44.8	4.7	12.4
16	20 46 18.87	2.57	0.31	15 9 35.2	41.3	4.6	12.2
17	20 45 32.24	1.32	0.31	15 25 20.3	37.5	4.5	12.0
18	20 45 15.10	— 0.12	0.31	15 39 32.7	33.5	4.5	11.8
19	20 45 26.17	+ 1.03	0.31	15 52 8.9	29.5	4.4	11.6
20	20 46 4.08	2.12	0.30	16 3 7.2	25.4	4.3	11.4
21	20 47 7.25	3.14	0.29	16 12 26.3	21.2	4.2	11.2
22	20 48 34.02	4.09	0.29	16 20 6.0	17.1	4.2	11.0
23	20 50 22.83	4.97	0.28	16 26 6.5	13.0	4.1	10.8
24	20 52 32.08	5.79	0.27	16 30 28.6	8.9	4.0	10.6
25	20 55 0.26	6.55	0.27	16 33 12.6	4.8	3.9	10.4
26	20 57 45.90	7.25	0.27	16 34 19.7	— 0.8	3.9	10.2
27	21 0 47.68	7.89	0.26	50.9	+ 3.2	3.8	10.0
28	21 4 4.32	8.49	0.26	3	7.1	3.7	9.8
29	21 7 34.63	+ 9.03	0.27	1	+ 11.0	3.6	9.6



## MARCH, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	21 4 17.29	S. 16 31 36.3	9.9442120	22 28.1	223 5 22.3	N. 0 25 23.8	9.63
2	21 7 48.49	16 27 53.1	.9517730	22 27.9	226 1 29.3	N. 0 3 46.5	.65
3	21 11 32.15	16 22 37.5	.9591578	22 27.9	228 55 25.4	S. 0 17 35.3	.65
4	21 15 27.30	16 15 50.7	.9663631	22 28.0	231 47 24.7	0 38 40.1	.65
5	21 19 33.00	16 7 33.6	.9733878	22 28.3	234 37 42.1	0 59 26.5	.66
6	21 23 48.46	15 57 47.5	.9802320	22 28.8	237 26 32.0	1 19 53.3	.66
7	21 28 12.83	15 46 33.6	.9868963	22 29.4	240 14 7.7	1 39 59.4	.66
8	21 32 45.47	15 33 52.6	.9933836	22 30.1	243 0 42.4	1 59 43.7	.66
9	21 37 25.75	15 19 45.7	9.9996963	22 30.9	245 46 29.3	2 19 5.1	.66
10	21 42 13.08	15 4 13.9	0.0058378	22 31.9	248 31 41.6	2 38 2.7	.66
11	21 47 6.94	14 47 18.0	.0118115	22 32.9	251 16 30.5	2 56 35.3	.66
12	21 52 6.88	14 28 59.1	.0176215	22 34.1	254 1 9.4	3 14 41.9	.66
13	21 57 12.47	14 9 18.2	.0232714	22 35.3	256 45 50.2	3 32 21.3	.66
14	22 2 23.34	13 48 16.0	.0287652	22 36.7	259 30 44.9	3 49 32.3	.66
15	22 7 39.16	13 25 53.1	.0341065	22 38.1	262 16 5.8	4 6 13.6	.66
16	22 12 59.66	13 2 10.7	.0393001	22 39.6	265 2 5.8	4 22 24.0	.66
17	22 18 24.56	12 37 9.6	.0443480	22 41.1	267 48 56.5	4 38 1.8	.66
18	22 23 53.63	12 10 50.6	.0492541	22 42.7	270 36 50.6	4 53 5.4	.66
19	22 29 26.74	11 43 14.0	.0540216	22 44.3	273 26 1.0	5 7 32.9	.66
20	22 35 3.69	11 14 21.0	.0586527	22 46.1	276 16 40.7	5 21 22.5	.66
21	22 40 44.36	10 44 12.6	.0631498	22 47.9	279 9 2.8	5 34 31.7	.65
22	22 46 28.64	10 12 48.9	.0675147	22 49.7	282 3 21.5	5 46 58.4	.65
23	22 52 16.49	9 40 10.9	.0717494	22 51.6	284 59 50.7	5 58 39.5	.65
24	22 58 7.82	9 6 19.7	.0758538	22 53.6	287 58 44.6	6 9 32.4	.65
25	23 4 2.64	8 31 15.6	.0798294	22 55.6	291 0 18.7	6 19 33.7	.64
26	23 10 0.94	7 54 59.6	.0836753	22 57.7	294 4 48.3	6 28 39.8	.64
27	23 16 2.73	7 17 32.6	.0873904	22 59.9	297 12 29.9	6 36 46.8	.64
28	23 22 8.05	6 38 55.1	.0909741	23 2.1	300 23 40.2	6 43 50.2	.63
29	23 28 16.98	5 59 8.2	.0944242	23 4.4	303 38 37.3	6 49 45.4	.63
30	23 34 29.56	5 18 13.0	.0977368	23 6.7	306 57 38.4	6 54 27.2	.62
31	23 40 45.92	4 36 10.4	.1009092	23 9.1	310 21 3.1	6 57 49.8	.62
32	23 47 6.15	S. 3 53 1.3	0.1039364	23 11.5	313 49 11.1	S. 6 59 47.1	9.61

## MARCH, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	21 7 34.63	+ 9.03	0.25	S. 16 28 10.1	+ 11.0	3.6	9.6
2	21 11 17.49	9.53	0.24	16 23 0.5	14.8	3.5	9.4
3	21 15 11.93	10.00	0.24	16 16 19.4	18.6	3.5	9.3
4	21 19 17.01	10.42	0.23	16 8 8.0	22.3	3.4	9.1
5	21 23 31.93	10.81	0.23	15 58 27.5	26.0	3.4	9.0
6	21 27 55.83	11.17	0.23	15 47 18.9	29.7	3.3	8.8
7	21 32 28.08	11.51	0.23	15 34 43.1	33.3	3.3	8.7
8	21 37 8.04	11.82	0.22	15 20 41.1	36.9	3.2	8.6
9	21 41 55.11	12.10	0.22	15 5 13.9	40.4	3.2	8.5
10	21 46 48.78	12.37	0.22	14 48 22.5	43.9	3.2	8.4
11	21 51 48.58	12.61	0.22	14 30 7.8	47.3	3.1	8.3
12	21 56 54.09	12.84	0.22	14 10 31.0	50.7	3.1	8.1
13	22 2 4.92	13.06	0.21	13 49 32.4	54.1	3.0	8.0
14	22 7 20.76	13.26	0.21	13 27 13.0	57.5	3.0	7.9
15	22 12 41.31	13.45	0.21	13 3 33.7	60.8	3.0	7.9
16	22 18 6.29	13.63	0.20	12 38 35.5	64.1	2.9	7.8
17	22 23 35.49	13.80	0.19	12 12 19.2	67.3	2.9	7.7
18	22 29 8.75	13.97	0.19	11 44 44.9	70.5	2.9	7.6
19	22 34 45.88	14.13	0.18	11 15 54.0	73.7	2.8	7.5
20	22 40 26.78	14.28	0.18	10 45 47.3	76.9	2.8	7.4
21	22 46 11.31	14.43	0.18	10 14 25.1	80.0	2.8	7.4
22	22 51 59.43	14.58	0.18	9 41 48.2	83.1	2.8	7.3
23	22 57 51.08	14.73	0.18	9 7 57.8	86.1	2.7	7.2
24	23 3 46.22	14.87	0.18	8 32 54.2	89.2	2.7	7.2
25	23 9 44.86	15.02	0.18	7 56 38.5	92.1	2.7	7.1
26	23 15 47.02	15.16	0.17	7 19 11.3	95.1	2.6	7.0
27	23 21 52.73	15.31	0.17	6 40 33.3	98.0	2.6	7.0
28	23 28 2.08	15.47	0.17	6 0 45.5	100.9	2.6	6.9
29	23 34 15.10	15.62	0.17	5 19 49.2	103.8	2.6	6.8
30	23 40 31.92	15.78	0.17	4 37 45.0	106.6	2.6	6.8
31	23 46 52.64	15.95	0.17	3 54 34.0	109.3	2.5	6.7
32	23 53 17.40	+16.12	0.17	S. 3 10 17.6	+112.0	2.5	6.7



APRIL, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lat.
	Noon.	Noon.	Noon.		Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	23 47 6.15	S. 3 53 1.3	0.1039364	23 11.5	313 49 11.1	S. 6 59 47.1	9.6
2	23 53 30.40	3 8 47.2	.1068130	23 14.1	317 22 22.3	7 0 12.5	.6
3	23 59 58.78	2 23 29.3	.1095321	23 16.7	321 0 58.0	6 58 58.9	.6
4	0 6 31.48	1 37 9.4	.1120868	23 19.4	324 45 19.9	6 55 58.8	.6
5	0 13 8.62	0 49 48.9	.1144676	23 22.1	328 35 49.9	6 51 4.0	.3
6	0 19 50.41	S. 0 1 30.1	.1166650	23 24.9	332 32 50.3	6 44 6.3	.3
7	0 26 36.99	N. 0 47 44.9	.1186678	23 27.9	336 36 43.9	6 34 57.1	.3
8	0 33 28.58	1 37 53.7	.1204630	23 30.9	340 47 53.0	6 23 27.6	.3
9	0 40 25.32	2 28 53.1	.1220366	23 34.0	345 6 39.4	6 9 29.3	.3
10	0 47 27.36	3 20 39.4	.1233736	23 37.2	349 33 24.4	5 52 53.9	.3
11	0 54 34.86	4 13 8.9	.1244565	23 40.4	354 8 27.0	5 33 33.9	.3
12	1 1 47.96	5 6 17.1	.1252667	23 43.8	358 52 5.4	5 11 23.1	.3
13	1 9 6.73	5 59 58.8	.1257851	23 47.3	3 44 33.7	4 46 16.6	.3
14	1 16 31.20	6 54 8.0	.1259904	23 50.9	8 46 2.5	4 18 12.4	.3
15	1 24 1.40	7 48 37.5	.1258605	23 54.5	13 56 38.5	3 47 11.1	.3
16	1 31 37.24	8 43 20.1	.1253727	23 58.3	19 16 21.5	3 13 16.9	.3
17	1 39 18.55	9 38 7.4	.1245037	* *	24 45 4.9	2 36 38.9	.3
18	1 47 5.09	10 32 49.9	.1232309	0 2.1	30 22 33.9	1 57 31.0	.3
19	1 54 56.52	11 27 17.0	.1215315	0 6.0	36 8 25.3	1 16 12.8	.3
20	2 2 52.37	12 21 17.9	.1193848	0 10.0	42 2 5.0	S. 0 33 9.6	.3
21	2 10 52.05	13 14 40.7	.1167720	0 14.1	48 2 48.8	N. 0 11 7.3	.4
22	2 18 54.87	14 7 13.1	.1136766	0 18.2	54 9 42.1	0 56 1.7	.4
23	2 26 59.99	14 58 42.2	.1100867	0 22.4	60 21 39.4	1 40 52.9	.4
24	2 35 6.49	15 48 55.6	.1059940	0 26.5	66 37 26.2	2 24 57.9	.4
25	2 43 13.31	16 37 41.1	.1013942	0 30.7	72 55 40.9	3 7 32.6	.4
26	2 51 19.38	17 24 45.9	.0962894	0 34.9	79 14 55.8	3 47 54.5	.4
27	2 59 23.50	18 9 59.8	.0906848	0 39.0	85 33 41.1	4 25 24.2	.4
28	3 7 24.47	18 53 12.5	.0845932	0 43.1	91 50 23.5	4 59 27.7	.4
29	3 15 21.11	19 34 15.3	.0780288	0 47.1	98 3 37.9	5 29 37.8	.4
30	3 23 12.17	20 13 1.2	.0710116	0 51.1	104 12 1.8	5 55 34.9	.4
31	3 30 56.53	N. 20 49 24.3	0.0635647	0 54.9	110 14 21.3	N. 6 17 7.3	9.5

APRIL, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
23 53 17.40	+16.12	0.17	S. 3 10 17.6	+112.0	2.5	6.7
23 59 46.32	16.29	0.17	2 24 57.0	114.7	2.5	6.7
0 6 19.60	16.48	0.17	1 38 34.0	117.2	2.5	6.7
0 12 57.35	16.67	0.17	0 51 9.9	119.7	2.5	6.6
0 19 39.77	16.87	0.17	S. 0 2 47.1	122.1	2.5	6.6
0 26 27.03	17.07	0.17	N. 0 46 32.3	124.5	2.5	6.6
0 33 19.34	17.29	0.17	1 36 46.0	126.7	2.5	6.5
0 40 16.84	17.51	0.17	2 27 50.7	128.7	2.5	6.5
0 47 19.68	17.73	0.17	3 19 42.8	130.6	2.5	6.5
0 54 28.04	17.96	0.16	4 12 18.6	132.3	2.4	6.4
1 1 42.04	18.20	0.16	5 5 33.6	133.9	2.4	6.4
1 9 1.77	18.44	0.16	5 59 22.4	135.2	2.4	6.4
1 16 27.25	18.68	0.16	6 53 39.2	136.2	2.4	6.4
1 23 58.52	18.92	0.16	7 48 16.6	136.9	2.4	6.4
1 31 35.49	19.16	0.16	8 43 7.6	137.3	2.4	6.4
1 39 18.00	19.38	0.16	9 38 3.5	137.3	2.4	6.4
* * *	*	*	* * *	*	*	*
1 47 5.77	19.60	0.17	10 32 54.7	136.9	2.5	6.5
1 54 58.50	19.79	0.17	11 27 30.7	136.0	2.5	6.5
2 2 55.70	19.97	0.17	12 21 40.4	134.7	2.5	6.5
2 10 56.77	20.12	0.18	13 15 11.9	132.8	2.5	6.6
2 19 1.00	20.23	0.18	14 7 52.6	130.5	2.5	6.6
2 27 7.55	20.31	0.18	14 59 29.6	127.5	2.5	6.7
2 35 15.46	20.34	0.18	15 49 50.4	124.1	2.6	6.8
2 43 23.69	20.33	0.18	16 38 42.8	120.1	2.6	6.8
2 51 31.14	20.28	0.18	17 25 53.8	115.7	2.6	6.9
2 59 36.59	20.17	0.18	18 11 11.5	110.9	2.6	7.0
3 7 38.81	20.01	0.19	18 54 28.8	105.7	2.7	7.1
3 15 36.63	19.80	0.19	19 35 33.8	100.2	2.7	7.2
3 23 28.76	19.54	0.19	20 14 21.1	94.3	2.8	7.3
3 31 14.08	+19.23	0.19	0 50 44.8	88.0	2.9	7.4



MAY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.	
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.
	Noon.	Noon.	Noon.		Noon.	Noon.
	<i>h m s</i>	<i>° ' "</i>		<i>h m</i>	<i>° ' "</i>	<i>° ' "</i>
1	3 30 56.53	N.20 49 24.3	0.0635647	0 54.9	110 14 21.3	N.6 17 7.3
2	3 38 33.06	21 23 20.6	0.0557125	0 58.5	116 9 33.4	6 34 11.2
3	3 46 0.72	21 51 47.3	0.0471828	1 2.0	121 56 45.0	6 46 49.5
4	3 53 18.54	22 23 43.1	0.0389032	1 5.4	127 35 15.5	6 55 11.1
5	4 0 25.59	22 50 8.1	0.0300027	1 8.6	133 4 34.7	6 59 29.6
6	4 7 21.01	23 14 3.1	0.0208096	1 11.5	138 24 24.0	7 0 1.9
7	4 14 4.03	23 35 30.1	0.0113517	1 14.3	143 34 34.2	6 57 7.1
8	4 20 33.92	23 54 31.8	0.0016568	1 16.9	148 35 5.3	6 51 5.2
9	4 26 50.01	24 11 11.7	9.9917516	1 19.2	153 26 3.3	6 42 16.9
10	4 32 51.68	24 25 33.5	9.9816623	1 21.3	158 7 40.7	6 31 2.0
11	4 38 38.35	24 37 41.4	9.9714140	1 23.1	162 40 14.9	6 17 39.5
12	4 44 9.41	24 47 39.6	9.9610318	1 24.6	167 4 5.7	6 2 27.4
13	4 49 24.35	24 55 32.8	9.9505398	1 25.9	171 19 36.7	5 45 41.9
14	4 54 22.67	25 1 25.8	9.9399616	1 26.9	175 27 12.0	5 27 38.0
15	4 59 3.84	25 5 23.0	9.9293218	1 27.7	179 27 17.5	5 8 29.0
16	5 3 27.39	25 7 29.2	9.9186456	1 28.1	183 20 18.8	4 48 26.8
17	5 7 32.86	25 7 49.0	9.9079572	1 28.2	187 6 41.7	4 27 41.8
18	5 11 19.78	25 6 26.7	8.972827	1 28.1	190 46 51.8	4 6 23.2
19	5 14 47.73	25 3 27.1	8.866501	1 27.6	194 21 14.0	3 44 39.0
20	5 17 56.33	24 58 54.3	8.760874	1 26.7	197 50 12.4	3 22 36.3
21	5 20 45.17	24 52 52.6	8.656254	1 25.6	201 14 10.4	3 0 21.0
22	5 23 13.96	24 45 26.2	8.552971	1 24.1	204 33 30.2	2 37 58.3
23	5 25 22.45	24 36 39.3	8.451368	1 22.3	207 48 33.4	2 15 33.1
24	5 27 10.38	24 26 36.2	8.351817	1 20.1	210 59 40.4	1 53 8.7
25	5 28 37.65	24 15 20.8	8.254716	1 17.6	214 7 10.7	1 30 48.8
26	5 29 44.23	24 2 57.2	8.160488	1 14.8	217 11 23.1	1 8 36.2
27	5 30 30.21	23 49 29.9	8.069573	1 11.6	220 12 35.8	0 46 33.4
28	5 30 55.81	23 35 3.6	7.982450	1 8.1	223 11 4.8	0 24 42.7
29	5 31 1.39	23 19 43.0	7.899598	1 4.2	226 7 7.5	N.0 3 5.9
30	5 30 47.45	23 3 32.9	7.821521	1 0.0	229 0 59.7	S.0 18 15.5
31	5 30 14.76	22 46 39.6	7.748741	0 55.6	231 52 55.6	0 39 19.7
32	5 29 24.22	N.22 29 8.8	9.7681776	0 50.8	234 43 10.3	S.1 0 5.4

MAY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
3 31 14.08	+19.23	0.19	N.20 50 44.6	+87.9	2.8	7.4
3 38 51.43	18.88	0.20	21 24 40.2	81.7	2.9	7.6
3 46 19.79	18.48	0.21	21 56 5.2	75.4	2.9	7.7
3 53 38.18	18.05	0.22	22 24 58.4	69.1	3.0	7.9
4 0 45.65	17.57	0.23	22 51 19.8	62.7	3.1	8.1
4 7 41.34	17.06	0.23	23 15 10.5	56.5	3.1	8.2
4 14 24.49	16.53	0.23	23 36 32.5	50.4	3.2	8.4
4 20 54.37	15.96	0.23	23 55 28.7	44.4	3.2	8.6
4 27 10.29	15.36	0.24	24 12 2.6	38.5	3.3	8.8
4 33 11.66	14.75	0.25	24 26 18.1	32.8	3.4	9.0
4 38 57.89	14.10	0.26	24 38 19.4	27.3	3.5	9.2
4 44 28.38	13.44	0.26	24 48 10.8	22.0	3.5	9.4
4 49 42.63	12.75	0.26	24 55 57.2	16.9	3.6	9.6
4 54 40.15	12.04	0.27	25 1 43.3	12.0	3.7	9.9
4 59 20.41	11.31	0.28	25 5 33.8	7.3	3.8	10.1
5 3 42.95	10.56	0.29	25 7 33.4	+ 2.7	3.9	10.4
5 7 47.32	9.80	0.29	25 7 46.9	- 1.6	4.0	10.7
5 11 33.07	9.01	0.30	25 6 18.5	5.7	4.1	10.9
5 14 59.78	8.21	0.31	25 3 13.1	9.7	4.2	11.2
5 18 7.07	7.39	0.32	24 58 35.0	13.5	4.3	11.5
5 20 54.57	6.56	0.32	24 52 28.4	17.1	4.4	11.7
5 23 22.02	5.72	0.33	24 44 57.5	20.5	4.5	12.0
5 25 29.18	4.87	0.33	24 36 6.7	23.7	4.6	12.3
5 27 15.79	4.01	0.34	24 26 0.4	26.8	4.7	12.5
5 28 41.77	3.15	0.35	24 14 42.3	29.7		8
5 29 47.12	2.29	0.36	24 2 16.8	32.4		
5 30 31.96	1.44	0.37	23 48 48.1	34.9		
5 30 56.52	+ 0.61	0.38	23 34 21.5			
5 31 1.18	- 0.21	0.38	23 19 5.5			
5 30 46.46	1.01	0.39	23 2			
5 30 13.13	1.76	0.39	22 45			
5 29 22.13	- 2.48	0.40	N.22 28			



JUNE, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.	
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.
	Noon.	Noon.	Noon.		Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
1	5 29 24.22	N. 22 29 8.8	9.7681776	0 50.8	234 43 10.3	S. 1 0 5.4
2	5 28 16.93	22 11 7.2	.7621126	0 45.7	237 31 57.8	1 20 31.7
3	5 26 54.23	21 52 42.5	.7567288	0 40.4	240 19 31.6	1 40 37.1
4	5 25 17.69	21 34 2.3	.7520729	0 34.9	243 6 4.9	2 0 20.7
5	5 23 29.02	21 15 15.5	.7481873	0 29.2	245 51 50.4	2 19 41.4
6	5 21 30.13	20 56 31.3	.7451088	0 23.3	248 37 1.6	2 38 38.2
7	5 19 23.16	20 37 59.5	.7428690	0 17.2	251 21 50.2	2 57 10.0
8	5 17 10.25	20 19 50.4	.7414909	0 11.1	254 6 29.0	3 15 15.8
9	5 14 53.73	20 2 14.7	.7409904	{ <sup>0</sup> <sub>23</sub> <sup>4.9</sup> <sub>50.7</sub> }	256 51 10.0	3 32 54.3
10	5 12 35.96	19 45 22.8	.7413752	23 52.5	259 36 5.5	3 50 4.3
11	5 10 19.25	19 29 25.0	.7426433	23 46.3	262 21 27.5	4 6 44.7
12	5 8 5.94	19 14 31.0	.7447837	23 40.3	265 7 28.6	4 22 54.0
13	5 5 58.29	19 0 50.5	.7477779	23 34.4	267 54 21.1	4 38 30.8
14	5 3 58.38	18 48 31.8	.7515991	23 28.6	270 42 17.4	4 53 33.3
15	5 2 8.15	18 37 42.3	.7562135	23 23.0	273 31 30.8	5 7 59.7
16	5 0 29.44	18 28 28.3	.7615810	23 17.7	276 22 13.6	5 21 48.0
17	4 59 3.91	18 20 54.7	.7676585	23 12.6	279 14 39.4	5 34 55.9
18	4 57 52.87	18 15 5.1	.7743971	23 7.7	282 9 1.8	5 47 21.1
19	4 56 57.59	18 11 1.6	.7817460	23 3.1	285 5 35.1	5 59 0.8
20	4 56 19.12	18 8 45.4	.7896543	22 58.8	288 4 34.0	6 9 52.2
21	4 55 58.31	18 8 15.9	.7980706	22 54.9	291 6 13.6	6 19 51.8
22	4 55 55.85	18 9 31.8	.8069420	22 51.2	294 10 49.1	6 28 56.1
23	4 56 12.25	18 12 30.4	.8162191	22 47.8	297 18 37.2	6 37 1.1
24	4 56 47.93	18 17 8.0	.8258526	22 44.8	300 29 54.5	6 44 2.3
25	4 57 43.20	18 23 20.4	.8357954	22 42.1	303 44 58.3	6 49 55.5
26	4 58 58.24	18 31 2.4	.8460032	22 39.7	307 4 7.4	6 54 34.8
27	5 0 33.19	18 40 7.9	.8564343	22 37.7	310 27 40.7	6 57 54.8
28	5 2 28.11	18 50 30.6	.8670487	22 36.0	313 55 57.9	6 59 49.3
29	5 4 43.05	19 2 3.5	.8778084	22 34.6	317 29 18.7	7 0 11.8
30	5 7 17.98	19 14 39.3	.8886790	22 33.5	321 8 4.9	6 58 55.0
31	5 10 12.85	N. 19 28 10.0	9.8996264	22 32.8	324 52 37.8	S. 6 55 51.3

JUNE, 1850.

At Transit over the Meridian of Greenwich.

Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
5 29 22.13	— 2.48	0.40	N. 22 28 31.2	— 44.4	5.5	14.6
5 28 14.53	3.14	0.40	22 10 32.5	45.5	5.6	14.9
5 26 51.70	3.75	0.41	21 52 11.3	46.3	5.7	15.1
5 25 15.19	4.28	0.41	21 33 35.0	46.7	5.7	15.2
5 23 26.70	4.74	0.41	21 14 52.6	46.8	5.8	15.3
5 21 28.14	5.12	0.41	20 56 13.2	46.4	5.8	15.4
5 19 21.60	5.41	0.41	20 37 46.4	45.7	5.8	15.4
5 17 9.21	5.61	0.41	20 19 42.2	44.6	5.8	15.5
{ 5 14 53.20 }	{ 5.71 }	{ 0.41 }	{ 20 2 11.2 }	{ 43.0 }	{ 5.9 }	{ 15.6 }
{ 5 12 36.09 }	{ 5.71 }	{ 0.41 }	{ 19 45 20.8 }	{ 40.9 }		
5 10 19.96	5.62	0.41	19 29 29.8	38.5	5.8	15.5
5 8 7.17	5.43	0.41	19 14 39.2	35.7	5.8	15.4
5 5 59.98	5.15	0.41	19 1 1.3	32.5	5.8	15.3
5 4 0.43	4.80	0.40	18 48 44.3	28.9	5.7	15.2
5 2 10.44	4.36	0.40	18 37 55.6	25.1	5.7	15.1
5 0 31.82	3.85	0.40	18 28 41.4	21.1	5.6	14.9
4 59 6.22	3.28	0.39	18 21 6.6	16.8	5.5	14.7
4 57 54.97	2.65	0.38	18 15 15.0	12.5	5.4	14.4
4 56 59.32	1.98	0.38	18 11 8.6	8.1	5.4	14.2
4 56 20.31	1.27	0.37	18 8 48.9	— 3.6	5.3	13.9
4 55 58.82	— 0.52	0.37	18 8 15.1	+ 0.8	5.2	13.7
4 55 55.56	+ 0.25	0.36	18 9 26.2	5.1	5.1	13.4
4 56 11.04	1.04	0.35	18 12 19.6	9.3	4.9	13.1
4 56 45.68	1.85	0.34	18 16 51.8	13.3	4.8	12.8
4 57 39.82	2.67	0.33	18 22 58.7	17.2	4.7	12.5
4 58 53.67	3.49		18 30 35.2	20.8	4.6	12.2
5 0 27.38	4.32		18 39 35.4	24.2	4.5	12.0
5 2 21.01	5.13		18 49 53.0	27.3	4.4	11.7
5 4 34.63	5.94		19 1 21.3	30.1	4.3	11.4
5 7 8.23	6.75		19 13 52.9	32.5	4.2	11.1
5 10 1.78	7.56		19 27 9.9	34.7	4.1	10.8
5 13 15.98	8.37		19 40 1.4	36.5	4.0	10.6



JULY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric	
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.
	Noon.	Noon.	Noon.		Noon.	Noon.
	<i>h m s</i>	<i>° ′ ″</i>		<i>h m</i>	<i>° ′ ″</i>	<i>° ′ ″</i>
1	5 10 12.85	N.19 28 10.0	9.8996264	22 32.8	324 52 37.8	S. 6 55 51
2	5 13 27.65	19 42 27.5	.9106192	22 32.4	328 43 19.2	6 50 52
3	5 17 2.29	19 57 23.2	.9216277	22 32.4	332 40 32.3	6 43 51
4	5 20 56.72	20 12 48.2	.9326230	22 32.7	336 44 39.0	6 34 37
5	5 25 10.87	20 28 33.1	.9435767	22 33.3	340 56 2.0	6 23 3
6	5 29 44.66	20 44 28.4	.9544609	22 34.2	345 15 2.8	6 9 0
7	5 34 37.98	21 0 24.0	.9652491	22 35.4	349 42 2.9	5 52 20
8	5 39 50.74	21 16 9.4	.9759137	22 37.0	354 17 21.2	5 32 55
9	5 45 22.75	21 31 33.9	.9864278	22 38.9	359 1 15.7	5 10 38
10	5 51 13.88	21 46 26.2	9.9967630	22 41.1	3 54 0.2	4 45 26
11	5 57 23.84	22 0 34.8	0.0068913	22 43.6	8 55 45.9	4 17 17
12	6 3 52.29	22 13 47.9	.0167844	22 46.5	14 6 38.5	3 46 10
13	6 10 38.84	22 25 53.4	.0264123	22 49.6	19 26 38.5	3 12 10
14	6 17 42.94	22 36 39.1	.0357445	22 53.0	24 55 38.3	2 35 28
15	6 25 3.90	22 45 52.8	.0447520	22 56.7	30 33 23.4	1 56 15
16	6 32 40.90	22 53 22.6	.0534046	23 0.6	36 19 29.6	1 14 53
17	6 40 32.95	22 58 57.1	.0616736	23 4.7	42 13 22.6	S. 0 31 48
18	6 48 38.89	23 2 25.0	.0695313	23 9.1	48 14 18.6	N. 0 12 30
19	6 56 57.37	23 3 37.1	.0769527	23 13.7	54 21 22.3	0 57 25
20	7 5 26.92	23 2 24.3	.0839142	23 18.4	60 33 27.7	1 42 16
21	7 14 5.90	22 58 39.7	.0903968	23 23.2	66 49 20.6	2 26 18
22	7 22 52.53	22 52 17.9	.0963853	23 28.2	73 7 38.2	3 8 50
23	7 31 45.05	22 43 15.5	.1018708	23 33.2	79 26 53.8	3 49 7
24	7 40 41.57	22 31 31.0	.1068459	23 38.2	85 45 35.1	4 26 30
25	7 49 40.27	22 17 4.8	.1113119	23 43.3	92 2 12.9	5 0 27
26	7 58 39.37	21 59 59.4	.1152731	23 48.3	98 15 19.8	5 30 30
27	8 7 37.19	21 40 18.9	.1187384	23 53.3	104 23 33.4	5 56 19
28	8 16 32.20	21 18 9.1	.1217214	23 58.3	110 25 40.9	6 17 43
29	8 25 23.02	20 53 36.9	.1242385	* *	116 20 38.8	6 34 38
30	8 34 8.42	20 26 50.1	.1263097	0 3.1	122 7 34.6	6 47 8
31	8 42 47.39	19 57 57.4	.1279555	0 7.8	127 45 48.1	6 55 22
32	8 51 19.09	N.19 27 7.8	0.1291985	0 12.4	133 14 50.1	N. 6 59 34

## JULY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
5 13 15.28	+ 8.48	0.28	N. 19 41 34.4	+ 36.5	4.0	10.6
5 16 48.66	9.30	0.27	19 56 27.7	37.9	3.9	10.3
5 20 41.89	10.13	0.26	20 11 51.2	39.0	3.8	10.1
5 24 54.89	10.95	0.26	20 27 35.4	39.6	3.7	9.8
5 29 27.61	11.77	0.26	20 43 30.8	39.9	3.6	9.6
5 34 19.96	12.59	0.25	20 59 27.2	39.7	3.5	9.3
5 39 31.85	13.40	0.25	21 15 14.3	39.1	3.4	9.1
5 45 3.10	14.20	0.25	21 30 41.3	38.1	3.4	8.9
5 50 53.60	15.00	0.24	21 45 36.9	36.5	3.3	8.7
5 57 3.10	15.79	0.24	21 59 49.6	34.5	3.2	8.5
6 3 31.24	16.56	0.23	22 13 7.4	31.9	3.1	8.3
6 10 17.66	17.31	0.23	22 25 18.1	28.9	3.1	8.1
6 17 21.81	18.03	0.22	22 36 9.5	25.3	3.0	7.9
6 24 43.02	18.73	0.21	22 45 29.2	21.2	2.9	7.8
6 32 20.47	19.39	0.21	22 53 5.1	16.7	2.9	7.6
6 40 13.18	20.00	0.21	22 58 45.7	11.6	2.8	7.5
6 48 19.99	20.56	0.21	23 2 19.4	6.1	2.8	7.4
6 56 39.57	21.06	0.20	23 3 37.0	+ 0.3	2.7	7.2
7 5 10.37	21.50	0.20	23 2 29.0	- 6.0	2.7	7.1
7 13 50.79	21.86	0.19	22 58 48.4	12.5	2.6	7.0
7 22 39.01	22.15	0.19	22 52 29.6	19.1	2.6	6.9
7 31 33.23	22.36	0.19	22 43 29.1	25.8	2.6	6.8
7 40 31.55	22.49	0.18	22 31 45.5	32.7		6.7
7 49 32.12	22.54	0.18	22 17 19.1	39.5		6.7
7 58 33.12	22.53	0.18	22 0 12.2	46.1		6.6
8 7 32.85	22.44	0.18	21 40 29.1	52.5		6.5
8 16 29.74	22.29	0.18	21 18 18.6	58.6		6.5
8 25 22.38	22.09	0.17	20 52 22.8	64.4		
* * *	*	*	*	*		
8 34 9.53	21.83	0.17	20 32 5.5	69.9		
8 42 50.17	21.55	0.17	19 58 6.6	75.0		
8 51 23.46	+ 21.22	0.17	N. 19 22 4.4	- 79.7		



## AUGUST, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	
	Noon.	Noon.	Noon.		Noon.	Noon.	
1	h m s 8 51 19.09	° ' " N. 19 27 7.8	0.1291985	h m 0 12.4	° ' " 133 14 50.1	° ' " N. 6 59 34.0	g
2	8 59 42.83	18 54 30.6	.1300616	0 16.9	138 34 21.7	6 59 59.5	
3	9 7 58.10	18 20 15.2	.1305673	0 21.2	143 44 14.2	6 56 58.6	
4	9 16 4.54	17 44 30.4	.1307384	0 25.4	148 44 27.3	6 50 51.3	
5	9 24 1.90	17 7 25.4	.1305965	0 29.4	153 35 7.6	6 41 58.1	
6	9 31 50.03	16 29 8.6	.1301620	0 33.3	158 16 27.9	6 30 38.8	
7	9 39 28.93	15 49 48.0	.1294545	0 37.0	162 48 45.7	6 17 12.8	
8	9 46 58.60	15 9 31.1	.1284913	0 40.5	167 12 20.6	6 1 57.5	
9	9 54 19.12	14 28 24.9	.1272891	0 43.9	171 27 36.6	5 45 9.4	
10	10 1 30.67	13 46 36.4	.1258628	0 47.2	175 34 57.7	5 27 3.3	
11	10 8 33.42	13 4 11.8	.1242258	0 50.3	179 34 49.7	5 7 52.5	
12	10 15 27.58	12 21 16.5	.1223903	0 53.3	183 27 38.4	4 47 48.7	
13	10 22 13.37	11 37 56.2	.1203674	0 56.1	187 13 49.3	4 27 2.5	
14	10 28 51.04	10 54 15.8	.1181666	0 58.8	190 53 48.2	4 5 43.0	
15	10 35 20.84	10 10 19.6	.1157960	1 1.3	194 28 0.1	3 43 58.1	
16	10 41 43.00	9 26 12.1	.1132630	1 3.7	197 56 48.9	3 21 54.9	
17	10 47 57.79	8 41 57.2	.1105740	1 6.0	201 20 38.1	2 59 39.4	
18	10 54 5.42	7 57 38.5	.1077338	1 8.2	204 39 49.5	2 37 16.6	
19	11 0 6.15	7 13 19.5	.1047469	1 10.3	207 54 45.3	2 14 51.2	
20	11 6 0.19	6 29 3.4	.1016172	1 12.2	211 5 45.0	1 52 26.9	
21	11 11 47.75	5 44 53.1	.0983469	1 14.1	214 13 9.2	1 30 7.2	
22	11 17 29.02	5 0 51.7	.0949381	1 15.8	217 17 15.7	1 7 54.8	
23	11 23 4.19	4 17 1.7	.0913921	1 17.5	220 18 23.0	0 45 52.4	
24	11 28 33.40	3 33 25.9	.0877097	1 19.0	223 16 47.4	0 24 2.1	
25	11 33 56.82	2 50 6.8	.0838907	1 20.5	226 12 46.3	N. 0 2 25.7	
26	11 39 14.56	2 7 6.6	.0799346	1 21.8	229 6 34.3	S. 0 18 55.1	
27	11 44 26.72	1 24 27.7	.0758405	1 23.1	231 58 27.1	0 39 58.8	
28	11 49 33.40	0 42 12.7	.0716066	1 24.2	234 48 39.0	1 0 44.1	
29	11 54 34.64	N. 0 0 23.8	.0672308	1 25.3	237 37 23.8	1 21 9.7	
30	11 59 30.48	S. 0 40 57.0	.0627104	1 26.3	240 24 55.4	1 41 14.5	
31	12 4 20.93	1 21 46.9	.0580432	1 27.2	243 11 27.1	2 0 57.4	
32	12 9 5.97	S. 2 2 3.9	.0532260	1 28.0	245 57 12.1	S. 2 20 17.5	g

## AUGUST, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	8 51 23.46	+21.22	0.17	N.19 26 51.2	-79.7	2.4	6.4
2	8 59 48.68	20.88	0.17	18 54 6.9	84.0	2.4	6.4
3	9 8 5.33	20.51	0.17	18 19 44.1	87.9	2.4	6.4
4	9 16 13.03	20.13	0.17	17 43 51.8	91.4	2.4	6.4
5	9 24 11.54	19.74	0.17	17 6 39.2	94.6	2.4	6.4
6	9 32 0.73	19.36	0.17	16 28 14.8	97.4	2.4	6.4
7	9 39 40.59	18.97	0.17	15 48 46.6	99.9	2.4	6.4
8	9 47 11.12	18.58	0.17	15 8 22.3	102.1	2.4	6.4
9	9 54 32.42	18.20	0.17	14 27 9.0	104.0	2.4	6.4
10	10 1 44.66	17.82	0.17	13 45 13.5	105.6	2.4	6.4
11	10 8 48.03	17.46	0.17	13 2 42.4	107.0	2.4	6.4
12	10 15 42.73	17.10	0.17	12 19 40.8	108.1	2.5	6.5
13	10 22 29.01	16.76	0.17	11 36 14.5	109.0	2.5	6.5
14	10 29 7.10	16.42	0.17	10 52 28.5	109.8	2.5	6.5
15	10 35 37.27	16.10	0.17	10 8 27.1	110.3	2.5	6.6
16	10 41 59.74	15.78	0.17	9 24 14.7	110.7	2.5	6.6
17	10 48 14.80	15.48	0.17	8 39 55.3	110.9	2.5	6.7
18	10 54 22.66	15.18	0.17	7 55 32.5	111.0	2.5	6.7
19	11 0 23.58	14.90	0.18	7 11 9.8	110.9	2.6	6.8
20	11 6 17.77	14.62	0.18	6 26 50.3	110.7	2.6	6.8
21	11 12 5.46	14.35	0.18	5 42 37.0	110.4	2.6	6.9
22	11 17 46.83	14.09	0.18	4 58 32.9	109.9	2.6	6.9
23	11 23 22.06	13.84	0.18	4 14 40.6	109.4	2.6	7.0
24	11 28 51.30	13.60	0.18	3 31 2.8	108.7	2.6	7.0
25	11 34 14.73	13.36	0.18	2 47 42.1	108.0		7.1
26	11 39 32.44	13.12	0.18	2 4 40.6	107.1		7.2
27	11 44 44.56	12.89	0.18	1 22 0.8			7.2
28	11 49 51.17	12.66	0.18	1 15.3			
29	11 54 52.31	12.43	0.18	3.9			
30	11 59 48.03	12.21	0.18	4.7			
31	12 4 38.33	11.98	0.18	5.4			
32	12 9 23.21	+11.76	0.19				



## SEPTEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	
	Noon.	Noon.	Noon.		Noon.	Noon.	
1	h m s 12 9 59.7	S. 2 2 3.9	0.0532260	h m 1 28.0	245 57 12.1	S. 2 20 17.5	9.6
2	12 13 45.56	2 41 45.3	.0482548	1 28.7	248 42 22.3	2 39 13.5	.6
3	12 18 19.61	3 20 48.7	.0431257	1 29.3	251 27 10.4	2 57 44.5	.6
4	12 22 48.01	3 59 11.4	.0378354	1 29.8	254 11 49.0	3 15 49.3	.6
5	12 27 10.61	4 36 50.8	.0323792	1 30.3	256 56 30.3	3 33 26.9	.6
6	12 31 27.20	5 13 44.0	.0267524	1 30.6	259 41 26.2	3 50 36.1	.6
7	12 35 37.58	5 49 47.9	.0209507	1 30.8	262 26 49.8	4 7 15.7	.6
8	12 39 41.47	6 24 59.0	.0149697	1 30.9	265 12 52.0	4 23 24.0	.6
9	12 43 38.53	6 59 13.7	.0088051	1 30.9	267 59 46.2	4 38 59.7	.6
10	12 47 28.37	7 32 28.6	.00024533	1 30.8	270 47 44.8	4 54 1.1	.6
11	12 51 10.56	8 4 39.3	.9959103	1 30.6	273 37 0.3	5 8 26.3	.6
12	12 54 44.61	8 35 41.1	.9891731	1 30.2	276 27 45.8	5 22 13.3	.6
13	12 58 9.97	9 5 29.3	.9822389	1 29.6	279 20 15.0	5 35 19.9	.6
14	13 1 25.96	9 33 58.5	.9751065	1 28.9	282 14 41.4	5 47 43.8	.6
15	13 4 31.90	10 1 2.6	.9677759	1 28.1	285 11 19.0	5 59 22.0	.6
16	13 7 26.97	10 26 35.1	.9602486	1 27.1	288 10 22.4	6 10 11.8	.6
17	13 10 10.30	10 50 28.9	.9525283	1 25.8	291 12 6.9	6 20 9.8	.6
18	13 12 40.90	11 12 35.8	.9446221	1 24.4	294 16 47.6	6 29 12.3	.6
19	13 14 57.74	11 32 47.3	.9365384	1 22.7	297 24 41.7	6 37 15.4	.6
20	13 16 59.66	11 50 53.7	.9282918	1 20.8	300 36 5.6	6 44 14.7	.6
21	13 18 45.40	12 6 44.5	.9199011	1 18.6	303 51 16.6	6 50 5.4	.6
22	13 20 13.67	12 20 7.9	.9113912	1 16.1	307 10 33.3	6 54 42.3	.6
23	13 21 23.07	12 30 51.6	.9027933	1 13.3	310 34 14.6	6 57 59.7	.6
24	13 22 12.19	12 38 41.8	.8941494	1 10.2	314 2 40.4	6 59 51.5	.6
25	13 22 39.61	12 43 24.5	.8855099	1 6.7	317 36 10.7	7 0 11.0	.6
26	13 22 43.97	12 44 44.3	.8769379	1 2.8	321 15 7.0	6 58 51.0	.6
27	13 22 23.98	12 42 26.2	.8685090	0 58.5	324 59 50.5	6 55 43.9	.6
28	13 21 38.53	12 36 14.7	.8603150	0 53.8	328 50 43.6	6 50 41.8	.59
29	13 20 26.86	12 25 55.9	.8524626	0 48.7	332 48 8.4	6 43 36.1	.58
30	13 18 48.58	12 11 17.4	.8450753	0 43.1	336 52 27.9	6 34 18.5	.58
31	13 16 43.81	S. 11 52 10.2	.8382932	0 37.1	341 4 4.2	S. 6 22 40.0	9.57

## SEPTEMBER, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup> 12 9 23·21	+ 11·76	0·19	S. <sup>°</sup> <sup>'</sup> <sup>"</sup> 2 4 30·4	-99·9	2·9	7·6
12 14 2·60	11·53	0·19	2 44 10·7	98·4	2·9	7·7
12 18 36·42	11·29	0·19	3 23 12·7	96·7	2·9	7·8
12 23 4·57	11·05	0·20	4 1 33·6	95·0	3·0	7·9
12 27 26·88	10·81	0·20	4 39 10·9	93·1	3·0	8·0
12 31 43·14	10·55	0·21	5 16 1·6	91·1	3·1	8·1
12 35 53·16	10·28	0·21	5 52 2·7	89·0	3·1	8·2
12 39 56·65	10·00	0·21	6 27 10·5	86·7	3·1	8·3
12 43 53·26	9·71	0·21	7 1 21·6	84·2	3·2	8·4
12 47 42·61	9·40	0·21	7 34 32·3	81·6	3·2	8·5
12 51 24·26	9·07	0·21	8 6 38·5	78·8	3·2	8·6
12 54 57·73	8·72	0·22	8 37 35·3	75·9	3·3	8·8
12 58 22·44	8·34	0·22	9 7 18·1	72·7	3·4	8·9
13 1 37·73	7·93	0·22	9 35 41·4	69·2	3·4	9·1
13 4 42·91	7·49	0·23	10 2 39·1	65·5	3·5	9·2
13 7 37·18	7·02	0·23	10 28 4·7	61·6	3·5	9·4
13 10 19·64	6·51	0·24	10 51 51·1	57·3	3·6	9·6
13 12 49·31	5·96	0·25	11 13 50·1	52·6	3·7	9·8
13 15 5·17	5·36	0·26	11 33 53·2	47·6	3·8	10·0
13 17 6·05	4·71	0·27	11 51 50·8	42·1	3·9	10·2
13 18 50·71	4·01	0·27	12 7 32·3	36·2	3·9	10·3
13 20 17·85	3·25	0·27	1°	29·8	4·0	10·5
13 21 26·09	2·43	0·27	1	22·9	4·0	10·7
13 22 14·05	1·56	0·28	1	15·4	4·1	11·0
13 22 40·34	+ 0·62	0·29		7·3	4·2	11·2
13 22 43·62	- 0·36	0·30		1·5	4·3	11·4
13 22 22·63	1·40	0·30		20·9	4·4	11·7
13 21 36·33	2·47	0·31		20·9	4·5	11·9
13 20 23·98	3·56	0·31			4·6	12·1
13 18 45·23	4·66	0·31				12·3
13 16 40·25	- 5·75					5



## OCTOBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.			
	Apparent Right Ascension.	Apparent Declination,	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad.	
	Noon.	Noon.	Noon.		Noon.	Noon.	N	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		
1	13 16 43.81	S. 11 52 10.2	9.8382932	0 37.1	341 4 4.2	S. 6 22 40.0	9.57	
2	13 14 13.36	11 28 30.5	.8322694	0 30.7	345 23 19.0	6 8 32.2	.56	
3	13 11 18.90	11 0 19.9	.8271682	0 23.9	349 50 33.6	5 51 46.8	.56	
4	13 8 2.98	10 27 49.5	.8231587	0 16.7	354 26 7.4	5 32 16.4	.55	
5	13 4 29.16	9 51 19.9	.8204068	0 9.2	359 10 17.2	5 9 54.8	.54	
6	13 0 41.96	9 11 22.2	.8190654	{ <sup>0</sup> <sub>32.7</sub> }	4 3 17.8	4 44 37.5	.54	
7	12 56 46.86	8 28 39.4	.8192635	23 45.9	9 5 20.0	4 16 22.3	.53	
8	12 52 50.05	7 44 4.7	.8210940	23 38.1	14 16 29.2	3 45 10.1	.52	
9	12 48 58.24	6 58 40.2	.8246059	23 30.5	19 36 44.7	3 11 5.7	.52	
10	12 45 18.22	6 13 32.9	.8297985	23 23.3	25 6 0.8	2 34 18.0	.51	
11	12 41 56.59	5 29 51.6	.8366147	23 16.4	30 44 1.4	1 55 1.4	.50	
12	12 38 59.43	4 48 43.0	.8449475	23 10.0	36 30 22.1	1 13 35.9	.50	
13	12 36 31.91	4 11 7.0	.8546453	23 4.2	42 24 28.7	S. 0 30 27.3	.49	
14	12 34 38.13	3 37 54.0	.8655221	22 58.9	48 25 36.7	N. 0 13 53.1	.49	
15	12 33 21.02	3 9 43.9	.8773688	22 54.3	54 32 50.1	0 58 48.4	.49	
16	12 32 42.27	2 47 3.8	.8899663	22 50.4	60 45 2.9	1 43 37.9	.48	
17	12 32 42.39	2 30 8.5	.9030983	22 47.1	67 1 1.1	2 27 38.6	.48	
18	12 33 20.93	2 19 2.9	.9165575	22 44.4	73 19 21.7	3 10 6.2	.48	
19	12 34 36.56	2 13 41.6	.9301545	22 42.2	79 38 37.0	3 50 18.5	.47	
20	12 36 27.31	2 13 52.1	.9437228	22 40.6	85 57 16.1	4 27 36.4	.47	
21	12 38 50.71	2 19 15.9	.9571198	22 39.5	92 13 48.7	5 1 26.3	.47	
22	12 41 44.01	2 29 30.3	.9702287	22 38.9	98 26 47.1	5 31 21.3	.47	
23	12 45 4.34	2 44 10.1	.9829571	22 38.7	104 34 50.2	5 57 2.3	.47	
24	12 48 48.78	3 2 49.0	.9952350	22 38.8	110 36 45.0	6 18 18.3	.47	
25	12 52 54.51	3 25 0.3	0.0070114	22 39.3	116 31 28.6	6 35 5.6	.47	
26	12 57 18.91	3 50 18.1	.0182541	22 40.0	122 18 9.3	6 47 27.8	.47	
27	13 1 59.50	4 18 17.2	.0289439	22 40.9	127 56 6.1	6 55 34.0	.47	
28	13 6 54.04	4 48 34.4	.0390742	22 42.1	133 24 50.6	6 59 38.0	.47	
29	13 12 0.56	5 20 48.0	.0486471	22 43.4	138 44 4.2	6 59 57.0	.47	
30	13 17 17.30	5 54 38.2	.0576718	22 44.9	143 53 38.7	6 56 50.1	.47	
31	13 22 42.74	6 29 47.2	.0661630	22 46.5	148 53 34.1	6 50 37.4	.47	
32	13 28 15.55	S. 7 5 58.6	0.0741391	22 48.2	153 43 57.1	N. 6 41 39.5	9.51	

## OCTOBER, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
1	<sup>h</sup> 13 <sup>m</sup> 16 <sup>s</sup> 40·25	— 5·75	0·32	S. 11 51 37·1	+53·5	4·7	12·5
2	13 14 9·89	6·77	0·33	11 27 57·3	64·8	4·8	12·6
3	13 11 15·82	7·71	0·33	10 59 49·6	75·8	4·8	12·8
4	13 8 0·60	8·53	0·33	10 27 25·4	86·1	4·9	12·9
5	13 4 27·76	9·18	0·33	9 51 5·2	95·4	4·9	13·0
6	$\left\{ \begin{smallmatrix} 13 & 0 & 41 \cdot 79 \\ 12 & 56 & 47 \cdot 91 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 9 \cdot 02 \\ 9 \cdot 02 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 0 \cdot 33 \\ 0 \cdot 33 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 9 & 11 & 19 \cdot 6 \\ 8 & 20 & 31 \cdot 1 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 103 \cdot 1 \\ 103 \cdot 9 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 4 \cdot 9 \\ 4 \cdot 9 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 13 \cdot 0 \\ 13 \cdot 0 \end{smallmatrix} \right\}$
7	12 52 52·37	9·76	0·33	7 44 31·3	112·3	4·9	13·0
8	12 49 1·71	9·42	0·33	6 59 21·6	113·2	4·9	12·9
9	12 45 22·57	8·80	0·32	6 14 27·8	111·0	4·8	12·7
10	12 42 1·46	7·92	0·31	5 30 57·0	106·1	4·7	12·5
11	12 39 4·40	6·80	0·31	4 49 55·1	98·6	4·6	12·2
12	12 36 36·49	5·49	0·30	4 12 21·3	88·8	4·5	12·0
13	12 34 41·88	4·04	0·30	3 39 6·0	77·2	4·4	11·7
14	12 33 23·52	2·48	0·29	3 10 49·1	64·1	4·3	11·4
15	12 32 43·19	— 0·88	0·28	2 47 58·4	50·1	4·2	11·0
16	12 32 41·48	+ 0·73	0·27	2 30 49·6	35·6	4·0	10·7
17	12 33 18·06	2·31	0·26	2 19 28·3	21·2	3·9	10·4
18	12 34 31·69	3·81	0·26	2 13 50·0	+ 7·1	3·8	10·1
19	12 36 20·46	5·23	0·25	2 13 43·2	— 6·4	3·7	9·8
20	12 38 42·00	6·54	0·24	2 18 50·2	19·0	3·6	9·5
21	12 41 33·59	7·74	0·23	2 28 48·7	30·7	3·5	9·2
22	12 44 52·38	8·81	0·23	2 43 13·9	41·2	3·4	8·9
23	12 48 35·50	9·76	0·22	3 1 39·8	50·7	3·3	8·7
24	12 52 40·13	10·60	0·22	3 23 39·9	59·	3·2	8·5
25	12 57 3·63	11·34	0·21	3 48 48·4			8·3
26	13 1 43·51	11·97	0·21	4 16 40·0			8·1
27	13 6 37·53	12·52	0·20	4 46 51·3			7·9
28	13 11 43·70	12·98	0·19	5 19 0			
29	13 17 0·23	13·38	0·19	5 52 48			
30	13 22 25·57	13·72	0·19	6 27 55			
31	13 27 58·40	14·01	0·19	7 4 6			
32	13 33 37·59	+14·25	0·18	7 41 6			



## NOVEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.	
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.
	Noon.	Noon.	Noon.		Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
1	13 28 15.55	S. 7 5 58.6	0.0741391	22 48.2	153 43 57.1	N. 6 41 39.5
2	13 33 54.63	7 42 58.4	.0816198	22 50.0	158 25 0.5	6 30 16.2
3	13 39 39.03	8 20 33.7	.0886272	22 51.9	162 57 1.8	6 16 46.4
4	13 45 27.92	8 58 33.2	.0951840	22 53.8	167 20 21.1	6 1 28.2
5	13 51 20.68	9 36 47.1	.1013124	22 55.8	171 35 22.2	5 44 37.5
6	13 57 16.75	10 15 6.3	.1070343	22 57.8	175 42 29.1	5 26 29.2
7	14 3 15.71	10 53 23.4	.1123706	22 59.9	179 42 7.8	5 7 16.6
8	14 9 17.18	11 31 31.7	.1173422	23 2.1	183 34 43.7	4 47 11.4
9	14 15 20.88	12 9 24.9	.1219681	23 4.2	187 20 43.2	4 26 24.0
10	14 21 26.59	12 46 57.6	.1262666	23 6.4	191 0 31.2	4 5 3.6
11	14 27 34.15	13 24 5.5	.1302548	23 8.6	194 34 33.4	3 43 18.1
12	14 33 43.42	14 0 44.2	.1339477	23 10.8	198 3 12.5	3 21 14.4
13	14 39 54.29	14 36 49.8	.1373603	23 13.1	201 26 52.8	2 58 58.6
14	14 46 6.71	15 12 19.1	.1405059	23 15.4	204 45 56.4	2 36 35.6
15	14 52 20.66	15 47 9.1	.1433967	23 17.7	208 0 44.3	2 14 10.2
16	14 58 36.11	16 21 17.2	.1460441	23 20.1	211 11 37.8	1 51 46.0
17	15 4 53.07	16 54 40.8	.1484582	23 22.5	214 18 55.8	1 29 26.4
18	15 11 11.57	17 27 17.6	.1506483	23 24.9	217 22 57.0	1 7 14.3
19	15 17 31.58	17 59 5.4	.1526228	23 27.3	220 23 59.2	0 45 12.2
20	15 23 53.16	18 30 2.3	.1543893	23 29.7	223 22 19.3	0 23 22.2
21	15 30 16.32	19 0 6.3	.1559545	23 32.2	226 18 13.7	N. 0 1 46.3
22	15 36 41.11	19 29 15.8	.1573242	23 34.7	229 11 58.4	S. 0 19 33.9
23	15 43 7.57	19 57 29.1	.1585037	23 37.2	232 3 47.9	0 40 37.2
24	15 49 35.73	20 24 44.5	.1594976	23 39.8	234 53 57.4	1 1 21.9
25	15 56 5.62	20 51 0.3	.1603098	23 42.4	237 42 40.1	1 21 46.9
26	16 2 37.27	21 16 15.0	.1609435	23 45.0	240 30 10.0	1 41 51.1
27	16 9 10.70	21 40 27.2	.1614015	23 47.6	243 16 40.0	2 1 33.3
28	16 15 45.92	22 3 35.4	.1616858	23 50.3	246 2 23.7	2 20 52.7
29	16 22 22.96	22 25 37.9	.1617976	23 53.0	248 47 33.3	2 39 48.0
30	16 29 1.83	22 46 33.4	.1617386	23 55.8	251 32 21.2	2 58 18.1
31	16 35 42.51	S. 23 6 20.4	0.1615093	23 58.5	254 17 0.2	S. 3 16 22.2

## NOVEMBER, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
13 33 37.59	+14.25	0.18	S. 7 41 6.8	-93.4	2.7	7.1
13 39 22.17	14.46	0.18	8 18 43.4	94.6	2.6	7.0
13 45 11.31	14.63	0.18	8 56 45.0	95.4	2.6	6.9
13 51 4.37	14.78	0.18	9 35 1.5	95.9	2.6	6.8
13 57 0.81	14.92	0.17	10 13 23.8	95.9	2.5	6.7
14 3 0.16	15.03	0.17	10 51 44.3	95.7	2.5	6.6
14 9 2.05	15.13	0.17	11 29 56.4	95.2	2.5	6.5
14 15 6.20	15.22	0.17	12 7 53.7	94.5	2.4	6.4
14 21 12.38	15.30	0.17	12 45 30.9	93.6	2.4	6.4
14 27 20.44	15.37	0.17	13 22 43.1	92.4	2.4	6.3
14 33 30.21	15.44	0.17	13 59 26.2	91.1	2.4	6.3
14 39 41.60	15.51	0.16	14 35 36.5	89.7	2.3	6.2
14 45 54.57	15.57	0.16	15 11 10.4	88.1	2.3	6.2
14 52 9.06	15.64	0.16	15 46 5.0	86.4	2.3	6.2
14 58 25.07	15.70	0.16	16 20 17.7	84.6	2.3	6.1
15 4 42.60	15.76	0.16	16 53 45.9	82.7	2.3	6.1
15 11 1.68	15.83	0.16	17 26 27.2	80.7	2.3	6.1
15 17 22.28	15.89	0.16	17 58 19.4	78.6	2.3	6.0
15 23 44.46	15.96	0.16	18 29 20.7	76.5	2.3	6.0
15 30 8.24	16.02	0.16	18 59 28.9	74.2	2.3	6.0
15 36 33.66	16.09	0.16	19 28 42.5	71.9	2.3	6.0
15 43 0.77	16.16	0.16	19 56 59.8	69.5	2.3	6.0
15 49 29.58	16.24	0.16	20 24 19.1	67.1	2.3	6.0
15 56 0.14	16.31	0.16	20 50 38.6	64.6	2.2	5.9
16 2 32.46	16.38	0.16	21 15 56.7	61.9	2.2	5.9
16 9 6.59	16.46	0.16	21 40 12.2	59.3	2.2	5.9
16 15 42.51	16.53	0.16	22 3 23.7	56.6	2.2	5.9
16 22 20.28	16.61	0.16	22 25 29.2	53.8		5.9
16 28 59.90	16.69	0.16	22 46 27.2	51.0		5.9
16 35 41.33	16.76	0.16	23 6 17.2	48.1		5.9
16 42 24.58	+16.84	0.16	23 24 56.2	45.2		5.9



## DECEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	
	Noon.	Noon.	Noon.		Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	16 35 42.51	S. 23 6 20.4	0.1615093	23 58.5	254 17 0.2	S. 3 16 22.2	9.6
2	16 42 24.99	23 24 57.6	.1611090	* *	257 1 41.9	3 33 59.1	9.6
3	16 49 9.24	23 42 23.2	.1605374	0 1.3	259 46 38.7	3 51 7.4	9.6
4	16 55 55.24	23 58 36.1	.1597935	0 4.2	262 32 3.0	4 7 45.9	9.6
5	17 2 42.95	24 13 34.7	.1588757	0 7.0	265 18 7.2	4 23 53.3	9.6
6	17 9 32.29	24 27 17.4	.1577818	0 9.9	268 5 3.4	4 39 28.0	9.6
7	17 16 23.21	24 39 43.1	.1565093	0 12.8	270 53 4.4	4 54 28.3	9.6
8	17 23 15.63	24 50 50.0	.1550549	0 15.8	273 42 22.7	5 8 52.4	9.6
9	17 30 9.43	25 0 37.1	.1534148	0 18.7	276 33 11.5	5 22 38.2	9.6
10	17 37 4.50	25 9 2.6	.1515843	0 21.7	279 25 43.9	5 35 43.5	9.6
11	17 44 0.72	25 16 5.2	.1495589	0 24.7	282 20 14.1	5 48 6.0	9.6
12	17 50 57.94	25 21 44.0	.1473329	0 27.7	285 16 56.1	5 59 42.9	9.6
13	17 57 55.97	25 25 57.4	.1448993	0 30.7	288 16 4.1	6 10 31.1	9.6
14	18 4 54.63	25 28 43.8	.1422510	0 33.8	291 17 54.1	6 20 27.4	9.6
15	18 11 53.71	25 30 2.5	.1393803	0 36.8	294 22 40.7	6 29 28.1	9.6
16	18 18 52.94	25 29 52.3	.1362785	0 39.9	297 30 40.8	6 37 29.3	9.6
17	18 25 52.06	25 28 12.1	.1329359	0 42.9	300 42 11.4	6 44 26.6	9.6
18	18 32 50.76	25 25 1.0	.1293418	0 46.0	303 57 29.7	6 50 15.1	9.6
19	18 39 48.71	25 20 18.2	.1254845	0 49.0	307 16 54.3	6 54 49.6	9.6
20	18 46 45.52	25 14 3.2	.1213519	0 52.0	310 40 44.3	6 58 4.5	9.6
21	18 53 40.72	25 6 15.6	.1169303	0 55.0	314 9 19.0	6 59 53.6	9.6
22	19 0 33.86	24 56 55.1	.1122047	0 57.9	317 42 59.0	7 0 10.1	9.6
23	19 7 24.36	24 46 1.9	.1071592	1 0.8	321 22 5.5	6 58 46.9	9.6
24	19 14 11.64	24 33 36.3	.1017772	1 3.7	325 7 0.1	6 55 36.4	9.6
25	19 20 54.95	24 19 39.3	.0960407	1 6.5	328 58 4.8	6 50 30.6	9.6
26	19 27 33.56	24 4 12.2	.0899310	1 9.2	332 55 42.1	6 43 21.1	9.6
27	19 34 6.56	23 47 16.7	.0834281	1 11.8	337 0 14.7	6 33 59.2	9.6
28	19 40 32.95	23 28 55.4	.0765119	1 14.3	341 12 4.6	6 22 16.3	9.6
29	19 46 51.56	23 9 11.4	.0691613	1 16.7	345 31 34.0	6 8 3.7	9.6
30	19 53 1.13	22 48 9.0	.0613562	1 18.9	349 59 3.7	5 51 13.4	9.6
31	19 59 0.21	22 25 53.3	.0530759	1 20.9	354 34 53.0	5 31 37.8	9.6
32	20 4 47.15	S. 22 2 30.7	0.0443026	1 22.7	359 19 19.2	S. 5 9 10.9	9.6

## DECEMBER, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
1	<sup>h</sup> 16 <sup>m</sup> 42 <sup>s</sup> 24 ·58	+16 ·84	0 ·16	S. 23 24 56 ·5	-45 ·2	2 ·2	5 ·9
2	* * *	*	*	* * *	*	*	*
3	16 49 9 ·61	16 ·91	0 ·16	23 42 24 ·1	42 ·1	2 ·2	5 ·9
4	16 55 56 ·42	16 ·99	0 ·16	23 58 38 ·8	39 ·1	2 ·2	5 ·9
5	17 2 44 ·94	17 ·06	0 ·17	24 13 38 ·9	35 ·9	2 ·3	6 ·0
6	17 9 35 ·11	17 ·12	0 ·17	24 27 22 ·8	32 ·7	2 ·3	6 ·0
7	17 16 26 ·87	17 ·19	0 ·17	24 39 49 ·3	29 ·5	2 ·3	6 ·0
8	17 23 20 ·15	17 ·25	0 ·17	24 50 56 ·8	26 ·2	2 ·3	6 ·0
9	17 30 14 ·81	17 ·31	0 ·17	25 0 44 ·3	22 ·8	2 ·3	6 ·0
0	17 37 10 ·76	17 ·36	0 ·17	25 9 9 ·7	19 ·3	2 ·3	6 ·0
1	17 44 7 ·87	17 ·40	0 ·17	25 16 11 ·8	15 ·8	2 ·3	6 ·1
2	17 51 5 ·98	17 ·44	0 ·17	25 21 49 ·8	12 ·3	2 ·3	6 ·1
3	17 58 4 ·90	17 ·47	0 ·17	25 26 1 ·9	8 ·7	2 ·3	6 ·1
4	18 5 4 ·46	17 ·49	0 ·17	25 28 46 ·6	5 ·0	2 ·3	6 ·2
5	18 12 4 ·44	17 ·50	0 ·17	25 30 3 ·3	-1 ·3	2 ·3	6 ·2
6	18 19 4 ·56	17 ·50	0 ·17	25 29 50 ·7	+2 ·4	2 ·4	6 ·3
7	18 26 4 ·56	17 ·49	0 ·17	25 28 7 ·7	6 ·2	2 ·4	6 ·3
8	18 33 4 ·12	17 ·47	0 ·17	25 24 53 ·4	10 ·0	2 ·4	6 ·4
9	18 40 2 ·92	17 ·43	0 ·17	25 20 6 ·9	13 ·9	2 ·4	6 ·4
20	18 47 0 ·55	17 ·37	0 ·18	25 13 47 ·9	17 ·7	2 ·5	6 ·5
21	18 53 56 ·54	17 ·29	0 ·18	25 5 55 ·9	21 ·6	2 ·5	6 ·5
22	19 0 50 ·44	17 ·19	0 ·18	24 56 30 ·6	25 ·5	2 ·5	6 ·6
23	19 7 41 ·64	17 ·07	0 ·18	24 45 32 ·3	29 ·4	2 ·5	6 ·7
24	19 14 29 ·54	16 ·92	0 ·19	24 33 1 ·2	33 ·2	2 ·6	6 ·8
25	19 21 13 ·44	16 ·74	0 ·19	24 18 58 ·5	37 ·0	2 ·6	6 ·9
26	19 27 52 ·55	16 ·52	0 ·19	24 3 25 ·4	40 ·7	2 ·6	7 ·0
27	19 34 25 ·97	16 ·26	0 ·20	23 46 23 ·8	44 ·4	2 ·7	7 ·1
28	19 40 52 ·67	15 ·96	0 ·20	23 27 56 ·3	47 ·9	2 ·7	7 ·2
29	19 47 11 ·47	15 ·60	0 ·20	23 8 6 ·1	51 ·3	2 ·8	7 ·3
30	19 53 21 ·08	15 ·19	0 ·20	22 46 57 ·7	54 ·4	2 ·8	7 ·4
31	19 59 20 ·05	14 ·71	0 ·21	22 24 36 ·2	57 ·3	2 ·9	7 ·6
32	20 5 6 ·69	+14 ·16	0 ·21	S. 22 1 8 ·2	+60 ·0	2 ·9	7



## JANUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.			
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	L Rad.	
	Noon.	Noon.	Noon.		Noon.	Noon.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		
1	17 43 31.21	S. 23 9 53.5	0.2131402	23 1.9	246 16 45.7	N. 0 32 2.4	9.86	
2	17 48 58.76	23 14 11.4	.2138239	23 3.3	247 52 7.8	0 26 26.8	.86	
3	17 54 26.66	23 17 46.5	.2144963	23 4.8	249 27 27.9	0 20 50.0	.86	
4	17 59 54.84	23 20 38.6	.2151575	23 6.4	251 2 46.0	0 15 12.4	.86	
5	18 5 23.24	23 22 47.7	.2158075	23 8.0	252 38 2.1	0 9 34.2	.86	
6	18 10 51.81	23 24 13.5	.2164462	23 9.5	254 13 16.4	N. 0 3 55.7	.86	
7	18 16 20.48	23 24 56.0	.2170736	23 11.1	255 48 28.8	S. 0 1 42.9	.86	
8	18 21 49.19	23 24 55.1	.2176897	23 12.6	257 23 39.5	0 7 21.3	.86	
9	18 27 17.87	23 24 10.7	.2182946	23 14.2	258 58 48.6	0 12 59.3	.86	
10	18 32 46.46	23 22 42.9	.2188882	23 15.7	260 33 56.0	0 18 36.6	.86	
11	18 38 14.90	23 20 31.7	.2194706	23 17.2	262 9 1.9	0 24 12.9	.86	
12	18 43 43.12	23 17 37.1	.2200418	23 18.7	263 44 6.4	0 29 48.0	.86	
13	18 49 11.07	23 13 59.4	.2206017	23 20.2	265 19 9.4	0 35 21.7	.86	
14	18 54 38.67	23 9 38.6	.2211504	23 21.7	266 54 11.1	0 40 53.6	.86	
15	19 0 5.87	23 4 34.9	.2216881	23 23.2	268 29 11.5	0 46 23.6	.86	
16	19 5 32.60	22 58 48.6	.22222147	23 24.7	270 4 10.8	0 51 51.4	.86	
17	19 10 58.81	22 52 19.8	.2227305	23 26.2	271 39 9.0	0 57 16.7	.86	
18	19 16 24.44	22 45 8.8	.2232356	23 27.7	273 14 6.1	1 2 39.4	.86	
19	19 21 49.43	22 37 16.0	.2237299	23 29.2	274 49 2.3	1 7 59.1	.86	
20	19 27 13.74	22 28 41.7	.2242137	23 30.6	276 23 57.6	1 13 15.6	.86	
21	19 32 37.31	22 19 26.1	.2246870	23 32.1	277 58 52.1	1 18 28.7	.86	
22	19 38 0.10	22 9 29.7	.2251498	23 33.5	279 33 45.9	1 23 38.2	.86	
23	19 43 22.06	21 58 53.0	.2256023	23 34.9	281 8 39.0	1 28 43.8	.86	
24	19 48 43.16	21 47 36.3	.2260446	23 36.3	282 43 31.6	1 33 45.2	.86	
25	19 54 3.35	21 35 40.1	.2264767	23 37.7	284 18 23.6	1 38 42.4	.86	
26	19 59 22.59	21 23 5.0	.2268987	23 39.0	285 53 15.2	1 43 35.0	.86	
27	20 4 40.85	21 9 51.3	.2273107	23 40.4	287 28 6.4	1 48 22.8	.86	
28	20 9 58.09	20 55 59.8	.2277126	23 41.7	289 2 57.3	1 53 5.7	.86	
29	20 15 14.29	20 41 30.8	.2281045	23 43.0	290 37 47.9	1 57 43.3	.86	
30	20 20 29.42	20 26 25.0	.2284863	23 44.3	292 12 38.3	2 2 15.5	.86	
31	20 25 43.46	20 10 42.9	.2288581	23 45.6	293 47 28.6	2 6 42.2	.86	
32	20 30 56.38	S. 19 54 25.2	0.2292198	23 46.8	295 22 18.9	S. 2 11 3.0	9.86	

## JANUARY, 1850.

At Transit over the Meridian of Greenwich.

Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
m s	s	s	° ' "	"	"	"
8 45 52	+13 67	0 36	S. 23 14 1 8	-9 9	5 0	5 2
4 13 76	13 68	0 36	23 17 38 8	8 1	5 0	5 2
9 42 28	13 69	0 36	23 20 32 8	6 3	5 0	5 2
5 11 02	13 70	0 36	23 22 43 6	4 5	5 0	5 2
0 39 93	13 70	0 36	23 24 11 1	2 7	5 0	5 2
6 8 95	13 71	0 36	23 24 55 2	-0 9	5 0	5 2
1 38 01	13 71	0 36	23 24 55 8	+0 9	5 0	5 2
7 7 05	13 71	0 36	23 24 12 9	2 7	5 0	5 2
2 35 99	13 70	0 36	23 22 46 4	4 5	5 0	5 2
8 4 79	13 70	0 36	23 20 36 4	6 3	5 0	5 2
3 33 36	13 69	0 36	23 17 42 9	8 1	5 0	5 2
9 1 67	13 68	0 36	23 14 6 2	9 9	5 0	5 2
4 29 62	13 66	0 36	23 9 46 3	11 7	5 0	5 2
9 57 17	13 64	0 36	23 4 43 5	13 5	5 0	5 2
5 24 26	13 62	0 36	22 58 58 0	15 3	4 9	5 1
0 50 83	13 59	0 36	22 52 29 8	17 1	4 9	5 1
6 16 81	13 57	0 36	22 45 19 4	18 8	4 9	5 1
1 42 15	13 54	0 36	22 37 27 1	20 5	4 9	5 1
7 6 80	13 51	0 36	22 28 53 2	22 3	4 9	5 1
2 30 71	13 48	0 35	22 19 37 8	24 0	4 9	5 1
7 53 84	13 45	0 35	22 9 41 6	25 7	4 9	5 1
3 16 13	13 41	0 35	21 59 5 1	27 4	4 9	5 1
8 37 56	13 37	0 35	21 47 48 5	29 1	4 9	
3 58 08	13 33	0 35	21 35 52 2	30 7	4 9	
9 17 64	13 29	0 35	21 23 17 0	32 3		
4 36 22	13 25	0 35	21 10 3 1	32		
9 53 77	13 21	0 35	20 56 11 4			
5 10 28	13 17	0 35	20 41 42 0			
0 25 71	13 12	0 35	20 26 35 9			
5 40 04	13 07	0 34	20 10 53 4			
0 53 25	13 03	0 34	19 54 35 2			
6 5 33	+12 98	0 34	S. 19 37 41 9			



## FEBRUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.			
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.	
	Noon.	Noon.	Noon.		Noon.	Noon.	N	
	<i>h m s</i>	<i>° ' "</i>		<i>h m</i>	<i>° ' "</i>	<i>° ' "</i>		
1	20 30 56.38	S. 19 54 25.2	0.2292198	23 46.8	295 22 18.9	S. 2 11 3.0	9.86	
2	20 36 8.17	19 37 32.5	.2295713	23 48.1	296 57 9.2	2 15 17.8	.86	
3	20 41 18.81	19 20 5.4	.2299127	23 49.3	298 31 59.5	2 19 26.4	.86	
4	20 46 28.28	19 2 4.6	.2302437	23 50.5	300 6 50.0	2 23 28.7	.86	
5	20 51 36.56	18 43 30.8	.2305645	23 51.7	301 41 40.7	2 27 24.4	.86	
6	20 56 43.65	18 24 24.6	.2308748	23 52.9	303 16 31.6	2 31 13.3	.86	
7	21 1 49.54	18 4 46.7	.2311746	23 54.0	304 51 22.8	2 34 55.3	.86	
8	21 6 54.22	17 44 37.9	.2314638	23 55.1	306 26 14.4	2 38 30.3	.86	
9	21 11 57.68	17 23 58.8	.2317425	23 56.2	308 1 6.5	2 41 58.0	.86	
10	21 16 59.93	17 2 50.2	.2320105	23 57.3	309 35 59.0	2 45 18.3	.86	
11	21 22 0.97	16 41 12.8	.2322679	23 58.3	311 10 52.0	2 48 31.1	.86	
12	21 27 0.79	16 19 7.4	.2325146	23 59.3	312 45 45.6	2 51 36.2	.86	
13	21 31 59.40	15 56 34.7	.2327506	* *	314 20 39.9	2 54 33.5	.86	
14	21 36 56.80	15 33 35.4	.2329760	0 0.4	315 55 34.8	2 57 22.8	.86	
15	21 41 53.01	15 10 10.4	.2331906	0 1.4	317 30 30.5	3 0 4.0	.86	
16	21 46 48.03	14 46 20.3	.2333946	0 2.3	319 5 27.0	3 2 37.0	.86	
17	21 51 41.88	14 22 6.0	.2335881	0 3.3	320 40 24.2	3 5 1.7	.86	
18	21 56 34.57	13 57 28.2	.2337709	0 4.2	322 15 22.3	3 7 18.0	.86	
19	22 1 26.13	13 32 27.7	.2339433	0 5.1	323 50 21.3	3 9 25.7	.86	
20	22 6 16.56	13 7 5.2	.2341052	0 6.0	325 25 21.2	3 11 24.7	.86	
21	22 11 5.90	12 41 21.6	.2342566	0 6.9	327 0 22.1	3 13 15.0	.86	
22	22 15 54.16	12 15 17.5	.2343976	0 7.8	328 35 23.9	3 14 56.5	.86	
23	22 20 41.38	11 48 53.8	.2345282	0 8.7	330 10 26.7	3 16 29.1	.86	
24	22 25 27.57	11 22 11.1	.2346484	0 9.5	331 45 30.5	3 17 52.6	.86	
25	22 30 12.78	10 55 10.3	.2347582	0 10.3	333 20 35.4	3 19 7.2	.86	
26	22 34 57.02	10 27 52.1	.2348576	0 11.1	334 55 41.5	3 20 12.6	.86	
27	22 39 40.34	10 0 17.2	.2349467	0 11.9	336 30 48.6	3 21 8.9	.86	
28	22 44 22.77	9 32 26.5	.2350253	0 12.6	338 5 56.9	3 21 55.9	.86	
29	22 49 4.34	S. 9 4 20.6	0.2350934	0 13.4	339 41 6.3	S. 3 22 33.7	9.86	

## FEBRUARY, 1850.

At Transit over the Meridian of Greenwich.

Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass, Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
m ° ' "	° ' "	° ' "	° ' "	° ' "	"	"
36 5 33	+12 98	0 34	S. 19 37 41 9	+42 9	4 9	5 1
11 16 25	12 93	0 34	19 20 14 2	44 4	4 9	5 1
16 25 99	12 88	0 34	19 2 12 7	45 8	4 8	5 0
51 34 52	12 83	0 34	18 43 38 2	47 1	4 8	5 0
56 41 87	12 78	0 34	18 24 31 3	48 4	4 8	5 0
1 48 01	12 73	0 34	18 4 52 7	49 7	4 8	5 0
6 52 94	12 68	0 34	17 44 43 1	51 0	4 8	5 0
11 56 64	12 63	0 34	17 24 3 1	52 3	4 8	5 0
16 59 12	12 58	0 34	17 2 53 6	53 5	4 8	5 0
22 0 39	12 53	0 34	16 41 15 3	54 7	4 8	5 0
27 0 44	12 48	0 33	16 19 9 0	55 8	4 8	5 0
31 59 26	12 43	0 33	15 56 35 3	56 9	4 8	5 0
* *	*	*	* * *	*	*	*
36 56 87	12 38	0 33	15 33 35 1	58 0	4 8	5 0
11 53 28	12 33	0 33	15 10 9 1	59 0	4 8	5 0
16 48 50	12 28	0 33	14 46 18 0	60 1	4 8	5 0
51 42 54	12 23	0 33	14 22 2 6	61 1	4 8	5 0
56 35 42	12 18	0 33	13 57 23 8	62 1	4 8	5 0
1 27 16	12 13	0 33	13 32 22 3	63 0	4 8	5 0
6 17 77	12 09	0 33	13 6 58 8	63 9	4 8	5 0
11 7 28	12 04	0 33	12 41 14 1	64 7	4 8	5 0
15 55 71	12 00	0 33	12 15 9 0	65 6	4 8	5 0
20 43 09	11 95	0 33	11 48 44 2	66 4	4 8	5 0
25 29 44	11 91	0 33	11 22 0 5	67 2	4 8	5 0
30 14 81	11 87	0 33	10 54 58 6	68 0		5 0
34 59 20	11 83	0 32	10 27 39 4			5 0
39 42 67	11 79	0 32	10 0 3 4			5 0
44 25 24	11 76	0 32	9 32 11 7			5 0
49 6 95	+11 72	0 32	S. 9 4 4			



## MARCH, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<i>h m s</i>	<i>° ' "</i>		<i>h m</i>	<i>° ' "</i>	<i>° ' "</i>	
1	22 49 43.4	S. 9 4 20.6	0.2350934	0 13.4	339 41 6.3	S. 3 22 33.7	9.8611
2	22 53 45.09	8 36 0.3	.2351509	0 14.1	341 16 17.0	3 23 2.2	.8611
3	22 58 25.05	8 7 26.4	.2351977	0 14.8	342 51 28.9	3 23 21.4	.8611
4	23 3 42.6	7 38 39.6	.2352336	0 15.5	344 26 42.1	3 23 31.3	.8611
5	23 7 42.76	7 9 40.7	.2352585	0 16.2	346 1 56.6	3 23 31.8	.8611
6	23 12 20.58	6 40 30.4	.2352724	0 16.9	347 37 12.3	3 23 22.9	.8611
7	23 16 57.76	6 11 9.4	.2352751	0 17.6	349 12 29.3	3 23 4.8	.8611
8	23 21 34.35	5 41 38.5	.2352664	0 18.3	350 47 47.6	3 22 37.2	.8611
9	23 26 10.36	5 11 58.5	.2352463	0 19.0	352 23 7.3	3 22 0.4	.8611
10	23 30 45.85	4 42 10.0	.2352147	0 19.6	353 58 28.3	3 21 14.2	.8611
11	23 35 20.86	4 12 13.9	.2351714	0 20.3	355 33 50.6	3 20 18.7	.8611
12	23 39 55.42	3 42 10.8	.2351164	0 20.9	357 9 14.3	3 19 14.0	.8611
13	23 44 29.57	3 12 1.6	.2350496	0 21.5	358 44 39.4	3 18 0.1	.8611
14	23 49 3.35	2 41 47.0	.2349708	0 22.1	0 20 5.9	3 16 37.1	.8611
15	23 53 36.80	2 11 27.7	.2348800	0 22.7	1 55 33.7	3 15 4.9	.8611
16	23 58 9.97	1 41 4.5	.2347773	0 23.3	3 31 3.0	3 13 23.7	.8611
17	0 2 42.88	1 10 38.1	.2346624	0 23.9	5 6 33.7	3 11 33.6	.8611
18	0 7 15.59	0 40 9.3	.2345354	0 24.5	6 42 5.9	3 9 34.5	.8611
19	0 11 48.13	S. 0 9 38.7	.2343962	0 25.1	8 17 39.5	3 7 26.6	.8611
20	0 16 20.54	N. 0 20 52.8	.2342449	0 25.7	9 53 14.6	3 5 10.0	.8611
21	0 20 52.86	0 51 24.7	.2340815	0 26.3	11 28 51.2	3 2 44.8	.8611
22	0 25 25.14	1 21 56.0	.2339059	0 26.9	13 4 29.2	3 0 11.1	.8611
23	0 29 57.43	1 52 26.1	.2337182	0 27.5	14 40 8.8	2 57 28.9	.8611
24	0 34 29.76	2 22 54.3	.2335183	0 28.1	16 15 49.8	2 54 38.5	.8611
25	0 39 2.18	2 53 19.8	.2333063	0 28.7	17 51 32.4	2 51 39.9	.8611
26	0 43 34.73	3 23 41.9	.2330820	0 29.3	19 27 16.5	2 48 33.3	.8611
27	0 48 7.46	3 53 59.9	.2328455	0 29.9	21 3 2.1	2 45 18.8	.8611
28	0 52 40.40	4 24 13.1	.2325966	0 30.5	22 38 49.3	2 41 56.5	.8611
29	0 57 13.61	4 54 20.7	.2323352	0 31.1	24 14 38.1	2 38 26.6	.8611
30	1 1 47.13	5 24 22.1	.2320614	0 31.7	25 50 28.4	2 34 49.3	.8611
31	1 6 21.00	5 54 16.5	.2317749	0 32.3	27 26 20.3	2 31 4.6	.8599
32	1 10 55.26	N. 6 24 3.2	0.2314757	0 33.0	29 2 13.7	S. 2 27 12.9	9.8599

## MARCH, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
1	<sup>h</sup> 22 <sup>m</sup> 49 <sup>s</sup> 6.95	+11.72	0.32	S. 9 4 4.8	+70.6	4.8	5.0
2	22 53 47.83	11.68	0.32	8 35 43.6	71.2	4.8	5.0
3	22 58 27.92	11.65	0.32	8 7 8.7	71.7	4.8	5.0
4	23 3 7.26	11.62	0.32	7 38 20.9	72.2	4.8	5.0
5	23 7 45.89	11.59	0.32	7 9 21.0	72.7	4.8	5.0
6	23 12 23.83	11.56	0.32	6 40 9.8	73.2	4.8	5.0
7	23 17 1.14	11.54	0.32	6 10 47.8	73.6	4.8	5.0
8	23 21 37.85	11.52	0.32	5 41 16.0	74.0	4.8	5.0
9	23 26 13.98	11.50	0.32	5 11 35.1	74.4	4.8	5.0
10	23 30 49.59	11.47	0.32	4 41 45.6	74.7	4.8	5.0
11	23 35 24.72	11.45	0.32	4 11 48.6	75.0	4.8	5.0
12	23 39 59.39	11.43	0.32	3 41 44.6	75.3	4.8	5.0
13	23 44 33.65	11.42	0.32	3 11 34.5	75.5	4.8	5.0
14	23 49 7.54	11.40	0.32	2 41 19.1	75.7	4.8	5.0
15	23 53 41.11	11.39	0.32	2 10 58.9	75.9	4.8	5.0
16	23 58 14.39	11.38	0.32	1 40 34.9	76.0	4.8	5.0
17	0 2 47.41	11.37	0.32	1 10 7.7	76.2	4.8	5.0
18	0 7 20.23	11.37	0.32	0 39 38.1	76.3	4.8	5.0
19	0 11 52.88	11.36	0.32	S. 0 9 6.7	76.3	4.8	5.0
20	0 16 25.40	11.36	0.32	N. 0 21 25.5	76.3	4.8	5.0
21	0 20 57.83	11.35	0.32	0 51 58.2	76.3	4.8	5.0
22	0 25 30.23	11.35	0.32	1 22 30.2	76.2	4.8	5.0
23	0 30 2.63	11.35	0.32	1 53 1.0	76.2	4.8	5.0
24	0 34 35.08	11.36	0.32	2 23 29.9	76.1	4.8	5.0
25	0 39 7.61	11.36	0.32	2 53 56.1	76.0		
26	0 43 40.28	11.37	0.32	3 24 18.9	75.9		
27	0 48 13.13	11.37	0.32	3 54 37.6	75.7		
28	0 52 46.19	11.38	0.32	4 24 51.4	75.5		
29	0 57 19.52	11.39	0.32	4 54 59.6	75.2		
30	1 1 53.16	11.40	0.32	5 25 1.7	74.9		
31	1 6 27.16	11.42	0.32	5 54 56.7	74.4		
32	1 11 1.55	+11.44	0.32	N. 6 24 44.0			



APRIL, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 10 55.26	N. 6 24 3.2	0.2314757	0 33.0	29 2 13.7	S. 2 27 12.9	9.8598
2	1 15 29.95	6 53 41.4	.2311637	0 33.7	30 38 8.8	2 23 14.2	.8597
3	1 20 5.12	7 23 10.5	.2308386	0 34.3	32 14 5.5	2 19 8.7	.8596
4	1 24 40.80	7 52 29.7	.2305004	0 34.9	33 50 3.8	2 14 56.6	.8596
5	1 29 17.04	8 21 38.3	.2301489	0 35.6	35 26 3.7	2 10 38.1	.8595
6	1 33 53.86	8 50 35.6	.2297838	0 36.2	37 2 5.3	2 6 13.4	.8595
7	1 38 31.32	9 19 20.7	.2294052	0 36.9	38 38 8.5	2 1 42.7	.8593
8	1 43 9.44	9 47 53.0	.2290127	0 37.6	40 14 13.3	1 57 6.2	.8593
9	1 47 48.25	10 16 11.6	.2286063	0 38.3	41 50 19.9	1 52 24.1	.8592
10	1 52 27.79	10 44 16.0	.2281858	0 39.0	43 26 28.1	1 47 36.6	.8592
11	1 57 8.10	11 12 5.2	.2277510	0 39.8	45 2 38.0	1 42 44.0	.8592
12	2 1 49.20	11 39 38.6	.2273019	0 40.5	46 38 49.6	1 37 46.4	.8588
13	2 6 31.12	12 6 55.5	.2268383	0 41.3	48 15 2.9	1 32 44.1	.8588
14	2 11 13.89	12 33 54.9	.2263601	0 42.0	49 51 18.0	1 27 37.4	.8588
15	2 15 57.53	13 0 36.2	.2258673	0 42.8	51 27 34.7	1 22 26.4	.8588
16	2 20 42.08	13 26 58.6	.2253598	0 43.6	53 3 53.2	1 17 11.4	.8588
17	2 25 27.55	13 53 1.2	.2248375	0 44.4	54 40 13.5	1 11 52.7	.8588
18	2 30 13.97	14 18 43.5	.2243004	0 45.2	56 16 35.5	1 6 30.5	.8584
19	2 35 1.35	14 44 4.6	.2237484	0 46.1	57 52 59.3	1 1 5.0	.8588
20	2 39 49.73	15 9 3.8	.2231815	0 47.0	59 29 24.9	0 55 36.5	.8588
21	2 44 39.12	15 33 40.3	.2225998	0 47.9	61 5 52.2	0 50 5.3	.8588
22	2 49 29.54	15 57 53.4	.2220031	0 48.8	62 42 21.3	0 44 31.6	.8588
23	2 54 21.00	16 21 42.4	.2213914	0 49.7	64 18 52.3	0 38 55.6	.8588
24	2 59 13.53	16 45 6.4	.2207647	0 50.6	65 55 25.0	0 33 17.8	.857
25	3 4 7.13	17 8 4.8	.2201230	0 51.6	67 31 59.5	0 27 38.2	.857
26	3 9 1.82	17 30 36.9	.2194662	0 52.5	69 8 35.9	0 21 57.2	.857
27	3 13 57.61	17 52 41.8	.2187942	0 53.5	70 45 14.0	0 16 15.0	.857
28	3 18 54.51	18 14 18.9	.2181069	0 54.5	72 21 53.9	0 10 31.9	.857
29	3 23 52.53	18 35 27.5	.2174043	0 55.6	73 58 35.7	S. 0 4 48.3	.857
30	3 28 51.66	18 56 6.8	.2166862	0 56.6	75 35 19.3	N. 0 55.7	.857
31	3 33 51.91	N. 19 16 16.2	0.2159525	0 57.7	77 12 4.7	N. 0 6 39.8	9.857

## APRIL, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
1	<sup>h</sup> 1 <sup>m</sup> 11 <sup>s</sup> 1.55	+11.44	0.32	N. 6 24 44.0	+74.3	4.8	5.0
2	1 15 36.37	11.46	0.32	6 54 22.8	73.9	4.8	5.0
3	1 20 11.67	11.48	0.32	7 23 52.5	73.5	4.8	5.0
4	1 24 47.49	11.50	0.32	7 53 12.2	73.0	4.8	5.0
5	1 29 23.87	11.52	0.32	8 22 21.3	72.6	4.8	5.0
6	1 34 0.83	11.55	0.33	8 51 19.1	72.1	4.9	5.1
7	1 38 38.44	11.58	0.33	9 20 4.8	71.6	4.9	5.1
8	1 43 16.71	11.61	0.33	9 48 37.6	71.1	4.9	5.1
9	1 47 55.68	11.64	0.33	10 16 56.6	70.5	4.9	5.1
10	1 52 35.38	11.67	0.33	10 45 1.4	69.9	4.9	5.1
11	1 57 15.85	11.70	0.34	11 12 51.1	69.2	4.9	5.1
12	2 1 57.12	11.73	0.34	11 40 24.9	68.6	4.9	5.1
13	2 6 39.22	11.77	0.34	12 7 42.2	67.9	4.9	5.1
14	2 11 22.17	11.80	0.34	12 34 41.9	67.1	4.9	5.1
15	2 16 5.99	11.84	0.34	13 1 23.6	66.3	4.9	5.1
16	2 20 50.73	11.88	0.34	13 27 46.3	65.5	4.9	5.1
17	2 25 36.39	11.92	0.34	13 53 49.1	64.7	4.9	5.1
18	2 30 23.00	11.96	0.34	14 19 31.6	63.8	4.9	5.1
19	2 35 10.58	12.00	0.34	14 44 52.9	62.9	4.9	5.1
20	2 39 59.17	12.04	0.34	15 9 52.3	62.0	4.9	5.1
21	2 44 48.77	12.08	0.34	15 34 28.9	61.0	4.9	5.1
22	2 49 39.41	12.13	0.34	15 58 42.1	60.0		
23	2 54 31.08	12.17	0.35	16 22 31.3	59.0		
24	2 59 23.84	12.22	0.35	16 45 55.3	58.0		
25	3 4 17.67	12.27	0.35	17 8 53.6			
26	3 9 12.60	12.31	0.35	17 31 25.6			
27	3 14 8.63	12.36	0.35	17 53 30.5			
28	3 19 5.78	12.40	0.35	18 15 7.4			
29	3 24 4.06	12.45	0.35	18 36 15.8			
30	3 29 3.45	12.50	0.35	18 56 54.8			
31	3 34 3.96	+12.54	0.35	N. 19 17 4.0			



MAY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	h m s	° ' "		h m	° ' "	° ' "	
1	3 33 51.91	N. 19 16 16.2	0.2159525	0 57.7	77 12 4.7	N. 0 6 39.8	9.8571
2	3 38 53.28	19 35 55.0	.2152031	0 58.8	78 48 51.8	0 12 23.6	.8571
3	3 43 55.77	19 55 2.5	.2144379	0 59.9	80 25 40.8	0 18 6.9	.8571
4	3 48 59.36	20 13 38.0	.2136565	1 1.0	82 2 31.6	0 23 49.5	.8571
5	3 54 4.05	20 31 40.8	.2128590	1 2.1	83 39 24.1	0 29 31.1	.8571
6	3 59 9.83	20 49 10.3	.2120450	1 3.2	85 16 18.4	0 35 11.3	.8571
7	4 4 16.67	21 6 5.8	.2112145	1 4.4	86 53 14.5	0 40 50.0	.8571
8	4 9 24.56	21 22 26.6	.2103672	1 5.6	88 30 12.3	0 46 26.8	.8570
9	4 14 33.48	21 38 12.3	.2095031	1 6.8	90 7 11.9	0 52 1.5	.8570
10	4 19 43.40	21 53 22.1	.2086219	1 8.0	91 44 13.1	0 57 33.7	.8569
11	4 24 54.30	22 7 55.6	.2077236	1 9.3	93 21 16.0	1 3 3.3	.8569
12	4 30 6.14	22 21 52.0	.2068079	1 10.5	94 58 20.6	1 8 30.0	.8568
13	4 35 18.89	22 35 10.8	.2058749	1 11.8	96 35 26.8	1 13 53.4	.8568
14	4 40 32.52	22 47 51.5	.2049244	1 13.1	98 12 34.6	1 19 13.4	.8567
15	4 45 46.98	22 59 53.6	.2039563	1 14.4	99 49 44.0	1 24 29.6	.8567
16	4 51 2.24	23 11 16.6	.2029706	1 15.7	101 26 54.9	1 29 41.9	.8567
17	4 56 18.23	23 21 59.9	.2019671	1 17.1	103 4 7.3	1 34 49.9	.8566
18	5 1 34.93	23 32 3.2	.2009457	1 18.4	104 41 21.2	1 39 53.4	.8566
19	5 6 52.28	23 41 26.0	.1999066	1 19.8	106 18 36.6	1 44 52.2	.8565
20	5 12 10.24	23 50 8.0	.1988496	1 21.1	107 55 53.3	1 49 46.0	.8565
21	5 17 28.74	23 58 8.7	.1977749	1 22.5	109 33 11.4	1 54 34.5	.8565
22	5 22 47.75	24 5 27.9	.1966824	1 23.8	111 10 30.8	1 59 17.6	.8565
23	5 28 7.21	24 12 5.3	.1955721	1 25.2	112 47 51.5	2 3 54.9	.8564
24	5 33 27.06	24 18 0.4	.1944440	1 26.6	114 25 13.4	2 8 26.4	.8564
25	5 38 47.25	24 23 13.2	.1932980	1 28.0	116 2 36.4	2 12 51.7	.8564
26	5 44 7.73	24 27 43.3	.1921340	1 29.4	117 40 0.5	2 17 10.6	.8564
27	5 49 28.43	24 31 30.5	.1909521	1 30.8	119 17 25.7	2 21 23.0	.8564
28	5 54 49.29	24 34 34.8	.1897521	1 32.2	120 54 51.8	2 25 28.5	.8563
29	6 0 10.26	24 36 56.0	.1885339	1 33.6	122 32 18.9	2 29 27.1	.8563
30	6 5 31.28	24 38 34.1	.1872975	1 35.0	124 9 46.8	2 33 18.5	.8563
31	6 10 52.28	24 39 28.9	.1860428	1 36.4	125 47 15.5	2 37 2.5	.8563
32	6 16 13.20	N. 24 39 40.4	0.1847696	1 37.8	127 24 44.9	N. 2 40 39.0	9.8563

MAY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
3 34 3·96	+12·54	0·35	N.19 17 4·0	+49·7	5·0	5·2
3 39 5·60	12·58	0·35	19 36 42·4	48·4	5·0	5·2
3 44 8·37	12·63	0·35	19 55 49·5	47·1	5·0	5·2
3 49 12·24	12·68	0·35	20 14 24·5	45·8	5·0	5·2
3 54 17·22	12·72	0·36	20 32 26·8	44·4	5·1	5·3
3 59 23·29	12·77	0·36	20 49 55·6	43·0	5·1	5·3
4 4 30·43	12·82	0·36	21 6 50·4	41·6	5·1	5·3
4 9 38·62	12·86	0·36	21 23 10·4	40·1	5·1	5·3
4 14 47·85	12·90	0·36	21 38 55·3	38·6	5·1	5·3
4 19 58·08	12·95	0·36	21 54 4·2	37·1	5·1	5·3
4 25 9·29	12·99	0·37	22 8 36·7	35·6	5·1	5·3
4 30 21·45	13·03	0·37	22 22 32·0	34·0	5·1	5·3
4 35 34·52	13·06	0·37	22 35 49·7	32·4	5·1	5·3
4 40 48·47	13·10	0·38	22 48 29·1	30·8	5·2	5·4
4 46 3·26	13·13	0·38	23 0 29·8	29·2	5·2	5·4
4 51 18·84	13·16	0·38	23 11 51·3	27·6	5·2	5·4
4 56 35·16	13·19	0·38	23 22 33·2	25·9	5·2	5·4
5 1 52·19	13·22	0·38	23 32 34·8	24·2	5·2	5·4
5 7 9·87	13·25	0·38	23 41 56·0	22·5	5·2	5·4
5 12 28·16	13·28	0·38	23 50 36·2	20·8	5·2	5·4
5 17 47·00	13·30	0·38	23 58 35·1	19·1	5·2	5·4
5 23 6·34	13·32	0·39	24 5 52·2		5·3	5·5
5 28 26·13	13·34	0·39	24 12 27·5		5·3	5·5
5 33 46·31	13·35	0·39	24 18 20·4		5·3	5·5
5 39 6·83	13·36	0·39	24 23 30·9		5·3	5·5
5 44 27·64	13·37	0·39	24 27 58·6		5·3	5·5
5 49 48·67	13·37	0·39	24 31 43·3		5·3	5·5
5 55 9·85	13·38	0·39	24 35 45·0		5·3	5·5
6 0 31·14	13·38	0·40	24 39 3·7		5·3	5·6
6 5 52·47	13·39	0·40	24 42 39·1		5·3	5·6
6 11 13·78	13·39	0·40	24 45 41·0		5·3	5·6
6 16 35·02	+13·38	0·40	N. 24 49·5		5·3	6



JUNE, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. V.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	6 16 13.20	N. 24 39 40.4	0.1847696	1 37.8	127 24 44.9	N. 2 40 39.0	9.8563
2	6 21 33.99	24 39 8.6	.1834779	1 39.3	129 2 15.0	2 44 7.7	.8563
3	6 26 54.59	24 37 53.5	.1821675	1 40.7	130 39 45.6	2 47 28.6	.8563
4	6 32 14.93	24 35 55.2	.1808382	1 42.1	132 17 16.7	2 50 41.3	.8563
5	6 37 34.94	24 33 13.9	.1794898	1 43.5	133 54 48.3	2 53 45.9	.8563
6	6 42 54.57	24 29 49.5	.1781222	1 44.9	135 32 20.2	2 56 42.0	.8563
7	6 48 13.75	24 25 42.4	.1767352	1 46.2	137 9 52.4	2 59 29.6	.8563
8	6 53 32.42	24 20 52.6	.1753286	1 47.6	138 47 24.8	3 2 8.5	.8563
9	6 58 50.53	24 15 20.4	.1739023	1 48.9	140 24 57.4	3 4 38.7	.8564
10	7 4 8.01	24 9 6.1	.1724562	1 50.3	142 2 29.9	3 6 59.9	.8564
11	7 9 24.80	24 2 9.9	.1709900	1 51.6	143 40 2.4	3 9 12.1	.8564
12	7 14 40.85	23 54 32.1	.1695038	1 53.0	145 17 34.7	3 11 15.2	.8564
13	7 19 56.09	23 46 13.1	.1679975	1 54.3	146 55 6.8	3 13 9.1	.8564
14	7 25 10.47	23 37 13.2	.1664709	1 55.6	148 32 38.5	3 14 53.6	.8564
15	7 30 23.94	23 27 32.8	.1649241	1 56.8	150 10 9.8	3 16 28.7	.8564
16	7 35 36.44	23 17 12.4	.1633571	1 58.1	151 47 40.6	3 17 54.4	.8564
17	7 40 47.93	23 6 12.3	.1617697	1 59.3	153 25 10.8	3 19 10.5	.8566
18	7 45 58.37	22 54 33.1	.1601619	2 0.6	155 2 40.3	3 20 17.0	.8566
19	7 51 7.72	22 42 15.2	.1585337	2 1.8	156 40 9.1	3 21 13.8	.8566
20	7 56 15.94	22 29 19.2	.1568851	2 3.0	158 17 37.0	3 22 1.0	.8567
21	8 1 23.00	22 15 45.6	.1552162	2 4.2	159 55 4.0	3 22 38.4	.8567
22	8 6 28.85	22 1 34.8	.1535269	2 5.3	161 32 29.9	3 23 6.1	.8568
23	8 11 33.47	21 46 47.5	.1518174	2 6.4	163 9 54.7	3 23 24.0	.8568
24	8 16 36.82	21 31 24.3	.1500876	2 7.5	164 47 18.4	3 23 32.2	.8568
25	8 21 38.90	21 15 25.7	.1483374	2 8.6	166 24 40.8	3 23 30.5	.8569
26	8 26 39.67	20 58 52.3	.1465667	2 9.7	168 2 1.8	3 23 19.1	.8570
27	8 31 39.12	20 41 44.9	.1447755	2 10.7	169 39 21.3	3 22 58.0	.8570
28	8 36 37.23	20 24 3.9	.1429637	2 11.7	171 16 39.3	3 22 27.1	.8571
29	8 41 33.99	20 5 50.1	.1411312	2 12.8	172 53 55.8	3 21 46.5	.8571
30	8 46 29.39	19 47 4.1	.1392779	2 13.8	174 31 10.5	3 20 56.3	.8571
31	8 51 23.43	N. 19 27 46.5	0.1374037	2 14.8	176 8 23.5	N. 3 19 56.5	9.8571

## JUNE, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	6 16 35.02	+13.38	0.40	N.24 39 39.5	- 0.5	5.4	5.6
2	6 21 56.10	13.38	0.40	24 39 4.8	2.4	5.4	5.6
3	6 27 16.99	13.37	0.40	24 37 46.6	4.2	5.4	5.6
4	6 32 37.62	13.36	0.41	24 35 45.1	6.0	5.5	5.7
5	6 37 57.91	13.34	0.41	24 33 0.6	7.8	5.5	5.7
6	6 43 17.83	13.32	0.41	24 29 32.9	9.6	5.5	5.7
7	6 48 37.28	13.30	0.41	24 25 22.4	11.3	5.5	5.7
8	6 53 56.21	13.28	0.41	24 20 29.2	13.1	5.5	5.7
9	6 59 14.57	13.25	0.41	24 14 53.5	14.9	5.5	5.7
10	7 4 32.31	13.22	0.42	24 8 35.7	16.7	5.6	5.8
11	7 9 49.33	13.19	0.42	24 1 35.9	18.4	5.6	5.8
12	7 15 5.61	13.16	0.42	23 53 54.4	20.1	5.6	5.8
13	7 20 21.07	13.13	0.42	23 45 31.7	21.8	5.6	5.8
14	7 25 35.66	13.09	0.42	23 36 28.1	23.5	5.6	5.8
15	7 30 49.33	13.05	0.42	23 26 44.0	25.2	5.7	5.9
16	7 36 2.02	13.00	0.42	23 16 19.8	26.9	5.7	5.9
17	7 41 13.69	12.96	0.42	23 5 15.9	28.5	5.7	5.9
18	7 46 24.31	12.92	0.42	22 53 32.8	30.1	5.7	5.9
19	7 51 33.82	12.87	0.42	22 41 11.1	31.7	5.8	6.0
20	7 56 42.20	12.83	0.42	22 28 11.2	33.3	5.8	6.0
21	8 1 49.41	12.78	0.42	22 14 33.7	34.8	5.8	6.0
22	8 6 55.41	12.73	0.42	22 0 19.0	36.4		6.0
23	8 12 0.16	12.68	0.42	21 45 27.8	37		6.0
24	8 17 3.63	12.62	0.42	21 30 0.8	38		6.1
25	8 22 5.82	12.57	0.42	21 13 58.2			6.1
26	8 27 6.71	12.51	0.42	20 57 21			6.1
27	8 32 6.26	12.45	0.42	20 40 9			6.1
28	8 37 4.46	12.40	0.42	20 22 21			
29	8 42 1.30	12.34	0.42	20 4			
30	8 46 56.77	12.28	0.42	19 45			
31	8 51 50.88	+12.23	0.43	N.19 25			



JULY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1	h m s 8 51 23.43	° ' " N.19 27 46.5	0.1374037	h m 2 14.8	° ' " 176 8 23.5	N.3 19 56.5	9.8578
2	8 56 16.09	19 7 58.1	.1355085	2 15.7	177 45 34.6	3 18 47.1	.8578
3	9 1 7.37	18 47 39.4	.1335920	2 16.6	179 22 43.8	3 17 28.2	.8578
4	9 5 57.27	18 26 51.2	.1316541	2 17.5	180 59 51.0	3 15 59.9	.8578
5	9 10 45.78	18 5 34.2	.1296947	2 18.3	182 36 56.2	3 14 22.3	.8578
6	9 15 32.91	17 43 49.1	.1277135	2 19.2	184 13 59.3	3 12 35.5	.8576
7	9 20 18.66	17 21 36.5	.1257103	2 20.0	185 51 0.1	3 10 39.5	.8576
8	9 25 3.03	16 58 57.3	.1236850	2 20.8	187 27 58.8	3 8 34.4	.8577
9	9 29 46.03	16 35 52.1	.1216373	2 21.5	189 4 55.2	3 6 20.4	.8578
10	9 34 27.65	16 12 21.6	.1195670	2 22.3	190 41 49.2	3 3 57.6	.8578
11	9 39 7.92	15 48 26.6	.1174742	2 23.0	192 18 40.8	3 1 26.0	.8578
12	9 43 46.85	15 24 7.8	.1153585	2 23.8	193 55 30.0	2 58 45.9	.8580
13	9 48 24.43	14 59 25.9	.1132199	2 24.5	195 32 16.7	2 55 57.4	.8580
14	9 53 0.69	14 34 21.6	.1110584	2 25.1	197 9 0.8	2 53 0.6	.8580
15	9 57 35.64	14 8 55.7	.1088738	2 25.7	198 45 42.4	2 49 55.6	.8582
16	10 2 9.29	13 43 8.9	.1066660	2 26.3	200 22 21.4	2 46 42.7	.8583
17	10 6 41.66	13 17 2.0	.1044350	2 26.9	201 58 57.7	2 43 22.0	.8584
18	10 11 12.77	12 50 35.6	.1021807	2 27.5	203 35 31.4	2 39 53.6	.8585
19	10 15 42.65	12 23 50.6	.0999032	2 28.1	205 12 2.4	2 36 17.7	.8585
20	10 20 11.31	11 56 47.5	.0976023	2 28.6	206 48 30.7	2 32 34.5	.8586
21	10 24 38.78	11 29 27.2	.0952781	2 29.1	208 24 56.3	2 28 44.3	.8587
22	10 29 5.08	11 1 50.2	.0929303	2 29.6	210 1 19.1	2 24 47.1	.8588
23	10 33 30.25	10 33 57.4	.0905594	2 30.0	211 37 39.2	2 20 43.2	.8589
24	10 37 54.31	10 5 49.4	.0881649	2 30.5	213 13 56.5	2 16 32.7	.8589
25	10 42 17.30	9 37 26.9	.0857469	2 31.0	214 50 11.1	2 12 15.9	.8590
26	10 46 39.24	9 8 50.6	.0833052	2 31.4	216 26 22.9	2 7 53.0	.8591
27	10 51 0.18	8 40 1.2	.0808398	2 31.8	218 2 32.0	2 3 24.2	.8592
28	10 55 20.13	8 10 59.3	.0782963	2 32.2	219 38 38.3	1 58 49.8	.8593
29	10 59 39.14	7 41 45.7	.0741131	2 32.6	221 14 41.9	1 54 9.9	.8594
30	11 3 57.24	7 12 20.9	.0713927	33.0	222 50 42.7	1 49 24.7	.8594
31	11 8 14.47	6 42 45.8		2 33.3	224 26 40.9	1 44 34.5	.8595
32	11 12 30.85	N. 6 13 0.9	0.0681500	2 33.6	226 2 36.3	N.1 39 39.6	9.8596

JULY, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
1	<sup>h</sup> 8 <sup>m</sup> 51 <sup>s</sup> 50·88	+12·23	0·43	N. 19° 25' 56·6	-49·0	6·1	6·3
2	8 56 43·60	12·17	0·43	19 6 4·6	50·3	6·1	6·3
3	9 1 34·93	12·11	0·43	18 45 42·3	51·5	6·1	6·3
4	9 6 24·88	12·05	0·44	18 24 50·5	52·7	6·2	6·4
5	9 11 13·43	11·99	0·44	18 3 30·0	53·9	6·2	6·4
6	9 16 0·59	11·94	0·44	17 41 41·5	55·1	6·2	6·4
7	9 20 46·37	11·88	0·44	17 19 25·6	56·2	6·2	6·4
8	9 25 30·76	11·82	0·44	16 56 43·1	57·3	6·3	6·5
9	9 30 13·78	11·76	0·44	16 33 34·7	58·4	6·3	6·5
0	9 34 55·41	11·71	0·44	16 10 0·9	59·4	6·3	6·5
1	9 39 35·68	11·65	0·44	15 46 2·8	60·4	6·3	6·6
2	9 44 14·62	11·60	0·44	15 21 40·9	61·4	6·3	6·6
3	9 48 52·20	11·54	0·44	14 56 56·1	62·3	6·3	6·6
4	9 53 28·45	11·49	0·44	14 31 48·9	63·2	6·3	6·6
5	9 58 3·39	11·43	0·44	14 6 20·2	64·1	6·4	6·7
6	10 2 37·03	11·38	0·44	13 40 30·6	65·0	6·4	6·7
7	10 7 9·39	11·33	0·44	13 14 21·1	65·8	6·4	6·7
8	10 11 40·48	11·27	0·44	12 47 52·1	66·6	6·5	6·8
9	10 16 10·33	11·22	0·44	12 21 4·6	67·4	6·5	6·8
20	10 20 38·96	11·17	0·45	11 53 59·0	68·1	6·6	6·9
21	10 25 6·41	11·12	0·45	11 26 36·4	68·8	6·6	6·9
22	10 29 32·69	11·07	0·45	10 58 57·2	69·5	6·6	6·9
23	10 33 57·82	11·02	0·45	10 31 2·3	70·1	6·6	6·9
24	10 38 21·85	10·98	0·46	10 2 52·1	70·7	6·7	7·0
25	10 42 44·81	10·94	0·46	9 34 27·7	71·3	6·7	7·0
26	10 47 6·72	10·90	0·46	9 5 49·4	71·9	6·8	7·1
27	10 51 27·62	10·85	0·46	8 36 58·2	72·4	6·8	7·1
28	10 55 47·54	10·81	0·46	8 7 54·5	72·9	6·8	7·1
29	11 0 6·52	10·77	0·46	7 38 39·3	73·4	6·9	7·2
30	11 4 24·59	10·74	0·46	7 9 12·9	73·8	6·9	7·2
31	11 8 41·80	10·70	0·47	6 39 36·3	74·2	7·0	7·3
32	11 12 58·15	+10·66	0·47	N. 6 9 49·9	-74·6	7·0	7·3



AUGUST, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 12 30.85	N.6 13 0.9	0.0681500	2 33.6	226 2 36.3	N.1 39 39.6	9.83
2	11 16 46.43	5 43 6.9	.0655381	2 33.9	227 38 29.1	1 34 40.1	.83
3	11 21 1.23	5 13 4.5	.0629010	2 34.2	229 14 19.2	1 29 36.4	.83
4	11 25 15.30	4 42 54.3	.0602384	2 34.5	230 50 6.7	1 24 28.5	.83
5	11 29 28.66	4 12 37.0	.0575500	2 34.8	232 25 51.6	1 19 16.9	.83
6	11 33 41.36	3 42 13.2	.0548355	2 35.1	234 1 34.0	1 14 1.7	.860
7	11 37 53.41	3 11 43.7	.0520946	2 35.3	235 37 13.9	1 8 43.1	.860
8	11 42 4.86	2 41 9.0	.0493269	2 35.6	237 12 51.3	1 3 21.5	.860
9	11 46 15.73	2 10 29.9	.0465323	2 35.8	238 48 26.3	0 57 57.1	.860
10	11 50 26.06	1 39 47.0	.0437103	2 36.0	240 23 58.9	0 52 30.1	.860
11	11 54 35.87	1 9 0.9	.0408609	2 36.3	241 59 29.2	0 47 0.8	.860
12	11 58 45.19	0 38 12.4	.0379836	2 36.5	243 34 57.2	0 41 29.4	.860
13	12 2 54.06	N.0 7 22.0	.0350784	2 36.7	245 10 23.0	0 35 56.2	.860
14	12 7 2.50	S.0 23 29.5	.0321450	2 36.9	246 45 46.7	0 30 21.5	.860
15	12 11 10.55	0 54 21.5	.0291832	2 37.0	248 21 8.2	0 24 45.5	.860
16	12 15 18.23	1 25 13.3	.0261929	2 37.2	249 56 27.7	0 19 8.4	.860
17	12 19 25.57	1 56 4.3	.0231737	2 37.4	251 31 45.2	0 13 30.6	.860
18	12 23 32.61	2 26 53.8	.0201255	2 37.6	253 7 0.8	0 7 52.3	.860
19	12 27 39.37	2 57 41.2	.0170483	2 37.8	254 42 14.5	N.0 2 13.7	.86
20	12 31 45.89	3 28 25.8	.0139417	2 38.0	256 17 26.4	S.0 3 24.9	.86
21	12 35 52.19	3 59 7.0	.0108058	2 38.1	257 52 36.6	0 9 3.2	.86
22	12 39 58.31	4 29 44.2	.0076404	2 38.3	259 27 45.2	0 14 41.0	.86
23	12 44 4.28	5 0 16.6	.0044451	2 38.4	261 2 52.2	0 20 18.1	.86
24	12 48 10.13	5 30 43.9	0.0012199	2 38.6	262 37 57.7	0 25 54.1	.86
25	12 52 15.89	6 1 5.2	9.9979643	2 38.7	264 13 1.7	0 31 28.8	.86
26	12 56 21.59	6 31 20.0	.9946782	2 38.9	265 48 4.4	0 37 2.0	.86
27	13 0 27.27	7 1 27.8	.9913611	2 39.0	267 23 5.8	0 42 33.4	.86
28	13 4 32.95	7 31 27.8	.9880128	2 39.2	268 58 6.0	0 48 2.7	.86
29	13 8 38.65	8 1 19.4	.9846329	2 39.3	270 33 5.0	0 53 29.8	.86
30	13 12 44.41	8 31 2.1	.9812210	2 39.5	272 8 2.9	0 58 54.3	.86
31	13 16 50.24	9 0 35.2	.9777766	2 39.6	273 42 59.9	1 4 16.1	.86
32	13 20 56.18	S.9 29 58.1	9.9742993	2 39.8	275 17 55.9	S.1 9 34.9	9.86

## AUGUST, 1850.

At Transit over the Meridian of Greenwich.

DAY OF THE Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- dia meter.	Hor. Par.
1	<sup>h</sup> 11 <sup>m</sup> 12 <sup>s</sup> 58.15	+10.66	0.47	N. 6° 9' 49".9	-74.6	7.0	7.3
2	11 17 13.71	10.63	0.47	5 39 54.6	75.0	7.1	7.4
3	11 21 28.48	10.60	0.47	5 9 51.0	75.3	7.1	7.4
4	11 25 42.53	10.57	0.48	4 39 39.7	75.6	7.2	7.5
5	11 29 55.86	10.54	0.48	4 9 21.2	75.9	7.2	7.5
6	11 34 8.54	10.51	0.48	3 38 56.5	76.1	7.2	7.5
7	11 38 20.57	10.48	0.49	3 8 26.1	76.3	7.3	7.6
8	11 42 32.00	10.46	0.49	2 37 50.6	76.5	7.3	7.6
9	11 46 42.85	10.44	0.49	2 7 10.7	76.7	7.3	7.6
10	11 50 53.16	10.42	0.50	1 36 27.2	76.9	7.4	7.7
11	11 55 2.96	10.40	0.50	1 5 40.6	77.0	7.5	7.8
12	11 59 12.26	10.38	0.51	0 34 51.5	77.1	7.6	7.9
13	12 3 21.11	10.36	0.51	N. 0 4 0.6	77.1	7.6	7.9
14	12 7 29.54	10.34	0.52	S. 0 26 51.2	77.2	7.7	8.0
15	12 11 37.59	10.32	0.52	0 57 43.5	77.2	7.7	8.0
16	12 15 45.26	10.31	0.53	1 28 35.5	77.1	7.8	8.1
17	12 19 52.59	10.30	0.53	1 59 26.6	77.1	7.8	8.1
18	12 23 59.63	10.29	0.53	2 30 16.1	77.0	7.9	8.2
19	12 28 6.39	10.28	0.53	3 1 3.4	76.9	7.9	8.2
20	12 32 12.92	10.27	0.54	3 31 47.8	76.8	8.0	8.3
21	12 36 19.22	10.26	0.54	4 2 28.9	76.6	8.1	8.4
22	12 40 25.35	10.26	0.54	4 33 5.8	76.4	8.1	8.4
23	12 44 31.33	10.25	0.55	5 3 37.8	76.2	8.2	8.5
24	12 48 37.19	10.25	0.55	5 34 4.7	76.0	8.2	8.5
25	12 52 42.97	10.25	0.56	6 4 25.5	75.7	8.3	8.6
26	12 56 48.69	10.24	0.56	6 34 39.7	75.5	8.4	8.7
27	13 0 54.40	10.24	0.57	7 4 46.9	75.3	8.4	8.7
28	13 5 0.11	10.24	0.58	7 34 46.2			8.8
29	13 9 5.84	10.24	0.58	4 37.1			8.9
30	13 13 11.63	10.24	0.59	18.9			9.0
31	13 17 17.50	10.25	0.59	51.1			9.1
32	13 21 23.48	+10.25	0.60	13.0			



## SEPTEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	13 20 56.18	S. 9 29 58.1	9.9742993	2 39.8	275 17 55.9	S. 1 9 34.9	9.8617
2	13 25 2.25	9 59 10.2	.9707885	2 39.9	276 52 51.0	1 14 50.4	.8618
3	13 29 8.47	10 28 10.9	.9672438	2 40.1	278 27 45.3	1 20 2.4	.8618
4	13 33 14.85	10 56 59.6	.9636647	2 40.3	280 2 38.9	1 25 10.8	.8619
5	13 37 21.41	11 25 35.6	.9600504	2 40.5	281 37 31.9	1 30 15.1	.8619
6	13 41 28.16	11 53 58.4	.9564006	2 40.6	283 12 24.3	1 35 15.3	.8619
7	13 45 35.12	12 22 7.3	.9527145	2 40.8	284 47 16.2	1 40 11.2	.8620
8	13 49 42.28	12 50 1.7	.9489917	2 41.0	286 22 7.6	1 45 2.3	.8620
9	13 53 49.67	13 17 41.0	.9452316	2 41.2	287 56 58.7	1 49 48.7	.8620
10	13 57 57.28	13 45 4.4	.9414338	2 41.3	289 31 49.5	1 54 30.0	.8621
11	14 2 5.12	14 12 11.4	.9375977	2 41.5	291 6 40.1	1 59 6.0	.8621
12	14 6 13.18	14 39 1.3	.9337228	2 41.7	292 41 30.5	2 3 36.6	.8621
13	14 10 21.47	15 5 33.5	.9298086	2 41.9	294 16 20.9	2 8 1.5	.8621
14	14 14 29.97	15 31 47.3	.9258547	2 42.1	295 51 11.2	2 12 20.5	.8622
15	14 18 38.69	15 57 42.1	.9218605	2 42.3	297 26 1.6	2 16 33.5	.8622
16	14 22 47.61	16 23 17.4	.9178257	2 42.5	299 0 52.1	2 20 40.2	.8622
17	14 26 56.73	16 48 32.4	.9137499	2 42.7	300 35 42.7	2 24 40.5	.8622
18	14 31 6.03	17 13 26.6	.9096328	2 42.9	302 10 33.5	2 28 34.2	.8622
19	14 35 15.51	17 37 59.4	.9054739	2 43.1	303 45 24.6	2 32 21.1	.8622
20	14 39 25.16	18 2 10.2	.9012729	2 43.3	305 20 16.0	2 36 1.0	.8622
21	14 43 34.95	18 25 58.5	.8970292	2 43.5	306 55 7.8	2 39 33.8	.8622
22	14 47 44.86	18 49 23.6	.8927423	2 43.8	308 30 0.1	2 42 59.3	.8622
23	14 51 54.89	19 12 25.0	.8884118	2 44.0	310 4 52.8	2 46 17.4	.8622
24	14 56 5.00	19 35 2.2	.8840371	2 44.2	311 39 46.1	2 49 27.9	.8622
25	15 0 15.17	19 57 14.6	.8796176	2 44.4	313 14 40.0	2 52 30.6	.8622
26	15 4 25.38	20 19 1.8	.8751527	2 44.7	314 49 34.6	2 55 25.5	.8622
27	15 8 35.60	20 40 23.2	.8706416	2 44.9	316 24 29.9	2 58 12.4	.8622
28	15 12 45.78	21 1 18.3	.8660838	2 45.1	317 59 25.9	3 0 51.2	.8622
29	15 16 55.90	21 21 46.6	.8614784	2 45.3	319 34 22.7	3 3 21.7	.8622
30	15 21 5.90	21 41 47.8	.8568248	2 45.6	321 9 20.3	3 5 43.8	.8622
31	15 25 15.74	S. 22 1 21.3	9.8521223	2 45.8	322 44 18.7	S. 3 7 57.5	9.8622

## SEPTEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
1	<sup>h</sup> 13 <sup>m</sup> 21 <sup>s</sup> 23·48	+10·25	0·60	S. 9° 33' 13·0	-73·2	8·8	9·1
2	13 25 29·59	10·26	0·60	10 2 24·1	72·7	8·8	9·2
3	13 29 35·85	10·26	0·60	10 31 23·7	72·2	8·9	9·3
4	13 33 42·28	10·27	0·60	11 0 11·2	71·7	8·9	9·3
5	13 37 48·89	10·28	0·61	11 28 45·9	71·2	9·0	9·4
6	13 41 55·69	10·29	0·62	11 57 7·5	70·6	9·1	9·5
7	13 46 2·70	10·30	0·63	12 25 15·0	70·0	9·2	9·6
8	13 50 9·92	10·31	0·63	12 53 7·9	69·4	9·3	9·7
9	13 54 17·37	10·32	0·64	13 20 45·6	68·7	9·4	9·8
10	13 58 25·04	10·33	0·64	13 48 7·5	68·1	9·4	9·8
11	14 2 32·93	10·33	0·65	14 15 12·8	67·4	9·5	9·9
12	14 6 41·05	10·34	0·66	14 42 1·0	66·7	9·6	10·0
13	14 10 49·40	10·35	0·67	15 8 31·3	65·9	9·7	10·1
14	14 14 57·96	10·36	0·68	15 34 43·3	65·1	9·8	10·2
15	14 19 6·74	10·37	0·69	16 0 36·1	64·3	9·9	10·3
16	14 23 15·72	10·38	0·70	16 26 9·3	63·5	10·0	10·4
17	14 27 24·89	10·39	0·70	16 51 22·2	62·6	10·1	10·5
18	14 31 34·25	10·40	0·71	17 16 14·3	61·7	10·2	10·6
19	14 35 43·78	10·41	0·72	17 40 44·8	60·8	10·3	10·7
20	14 39 53·48	10·41	0·73	18 4 53·3	59·9	10·4	10·8
21	14 44 3·33	10·41	0·74	18 28 39·2	58·9	10·5	10·9
22	14 48 13·30	10·42	0·74	18 52 1·9	57·9	10·6	11·0
23	14 52 23·38	10·42	0·75	19 15 0·8	56·9	10·7	11·1
24	14 56 33·54	10·42	0·75	19 37 35·4	55·9	10·8	11·2
25	15 0 43·75	10·43	0·76	19 59 1·1	54·9	10·9	11·3
26	15 4 54·00	10·43	0·77	0 1 53·8	53·8	11·0	11·4
27	15 9 4·26	10·43	0·79		52·7		11·5
28	15 13 14·47	10·42	0·80		51		11·7
29	15 17 24·62	10·42	0·81		50		11·8
30	15 21 34·65	10·41	0·81		49		11·9
31	15 25 44·50	+10·41	0·82		48		0



OCTOBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	15 25 15.74	S. 22 1 21.3	9.8521223	2 45.8	322 44 18.7	S. 3 7 57.5	9.86
2	15 29 25.37	22 20 26.7	.8473698	2 46.0	324 19 18.1	3 10 2.6	.86
3	15 33 34.73	22 39 3.6	.8425666	2 46.2	325 54 18.4	3 11 59.1	.86
4	15 37 43.75	22 57 11.5	.8377117	2 46.5	327 29 19.6	3 13 46.7	.86
5	15 41 52.37	23 14 50.1	.8328041	2 46.7	329 4 21.8	3 15 25.5	.86
6	15 46 0.52	23 31 58.9	.8278430	2 46.9	330 39 25.1	3 16 55.4	.86
7	15 50 8.11	23 48 37.5	.8228276	2 47.1	332 14 29.4	3 18 16.2	.86
8	15 54 15.05	24 4 45.6	.8177569	2 47.2	333 49 34.8	3 19 28.0	.86
9	15 58 21.27	24 20 22.8	.8126302	2 47.4	335 24 41.3	3 20 30.7	.86
10	16 2 26.65	24 35 28.8	.8074466	2 47.5	336 59 48.9	3 21 24.2	.86
11	16 6 31.10	24 50 3.2	.8022054	2 47.7	338 34 57.7	3 22 8.4	.86
12	16 10 34.50	25 4 5.9	.7969058	2 47.8	340 10 7.7	3 22 43.4	.86
13	16 14 36.75	25 17 36.6	.7915471	2 47.9	341 45 18.9	3 23 9.1	.86
14	16 18 37.72	25 30 34.9	.7861287	2 47.9	343 20 31.4	3 23 25.5	.86
15	16 22 37.30	25 43 0.8	.7806502	2 48.0	344 55 45.1	3 23 32.5	.86
16	16 26 35.35	25 54 53.9	.7751112	2 48.0	346 31 0.1	3 23 30.2	.86
17	16 30 31.74	26 6 14.1	.7695112	2 48.0	348 6 16.3	3 23 18.5	.86
18	16 34 26.35	26 17 1.3	.7638498	2 47.9	349 41 33.9	3 22 57.5	.86
19	16 38 19.03	26 27 15.3	.7581268	2 47.9	351 16 52.8	3 22 27.1	.86
20	16 42 9.63	26 36 56.2	.7523417	2 47.8	352 52 13.0	3 21 47.4	.86
21	16 45 58.02	26 46 3.9	.7464945	2 47.6	354 27 34.6	3 20 58.4	.86
22	16 49 44.04	26 54 38.4	.7405847	2 47.4	356 2 57.5	3 20 0.2	.86
23	16 53 27.54	27 2 39.7	.7346122	2 47.2	357 38 21.8	3 18 52.7	.86
24	16 57 8.35	27 10 7.9	.7285766	2 47.0	359 13 47.5	3 17 36.0	.86
25	17 0 46.31	27 17 3.1	.7224779	2 46.7	0 49 14.6	3 16 10.2	.86
26	17 4 21.24	27 23 25.3	.7163159	2 46.3	2 24 43.1	3 14 35.3	.86
27	17 7 52.97	27 29 14.8	.7100905	2 45.9	4 0 13.0	3 12 51.4	.86
28	17 11 21.32	27 34 31.7	.7038018	2 45.4	5 35 44.4	3 10 58.5	.86
29	17 14 46.09	27 39 16.2	.6974500	2 44.9	7 11 17.2	3 8 56.8	.86
30	17 18 7.09	27 43 28.5	.6910349	2 44.3	8 46 51.5	3 6 46.2	.86
31	17 21 24.10	27 47 8.8	.6845570	2 43.6	10 22 27.3	3 4 27.0	.86
32	17 24 36.91	S. 27 50 17.5	9.6780165	2 42.9	11 58 4.5	S. 3 1 59.2	9.86

OCTOBER, 1850.

At Transit over the Meridian of Greenwich.

Day in Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	15 25 44.50	+10.41	0.82	S. 22 3 34.6	-48.2	11.5	12.0
2	15 29 54.14	10.40	0.84	22 22 36.9	47.0	11.7	12.2
3	15 34 3.49	10.38	0.85	22 41 10.6	45.8	11.8	12.3
4	15 38 12.51	10.37	0.86	22 59 15.4	44.6	12.0	12.5
5	15 42 21.11	10.35	0.88	23 16 50.7	43.3	12.1	12.6
6	15 46 29.24	10.33	0.89	23 33 56.1	42.1	12.3	12.8
7	15 50 36.78	10.30	0.90	23 50 31.3	40.8	12.4	12.9
8	15 54 43.68	10.27	0.91	24 6 36.0	39.6	12.5	13.0
9	15 58 49.83	10.24	0.92	24 22 9.7	38.3	12.7	13.2
10	16 2 55.14	10.20	0.93	24 37 12.1	37.0	12.8	13.3
11	16 6 59.49	10.16	0.95	24 51 42.9	35.6	12.9	13.4
12	16 11 2.78	10.11	0.96	25 5 42.0	34.3	13.1	13.6
13	16 15 4.90	10.05	0.98	25 19 9.0	32.9	13.3	13.8
14	16 19 5.73	10.00	1.00	25 32 3.5	31.6	13.5	14.0
15	16 23 5.15	9.94	1.01	25 44 25.6	30.2	13.7	14.2
16	16 27 3.02	9.87	1.03	25 56 15.0	28.9	13.9	14.4
17	16 30 59.21	9.80	1.04	26 7 31.3	27.5	14.0	14.6
18	16 34 53.59	9.73	1.06	26 18 14.6	26.1	14.2	14.8
19	16 38 46.03	9.64	1.08	26 28 24.7	24.7	14.4	15.0
20	16 42 36.36	9.55	1.10	26 38 1.7	23.4	14.6	15.2
21	16 46 24.46	9.45	1.11	26 47 5.5	22.0	14.8	15.4
22	16 50 10.16	9.35	1.12	26 55 36.1	20.6	14.9	15.5
23	16 53 53.33	9.24	1.13	27 3 33.4	19.2	15.1	15.7
24	16 57 33.77	9.13	1.15	27 10 57.7	17.9	15.3	15.9
25	17 1 11.34	9.00	1.17	27 17 49.0		15.6	16.2
26	17 4 45.85	8.87	1.19	27 24 7.3		15.9	16.5
27	17 8 17.14	8.73	1.21	27 29 53.0		16.2	16.8
28	17 11 45.02	8.59	1.23	27 35 6.0		16.4	17.0
29	17 15 9.29	8.43	1.25	27 39 46.8		16.5	17.2
30	17 18 29.76	8.27	1.27	27 43 55.8		16.8	17.5
31	17 21 46.22	8.10	1.29	27 47 31.9		17.1	17.8
32	17 24 58.45	+7.92	1.31	27 50 36.9		17.3	18.0



## NOVEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	17 24 58.45	+ 7.92	1.31	S. 27 50 36.9	- 7.1	17.3	18.0
2	17 28 6.22	7.73	1.33	27 53 10.6	5.8	17.6	18.3
3	17 31 9.31	7.53	1.36	27 55 13.3	4.5	17.9	18.6
4	17 34 7.46	7.31	1.38	27 56 45.2	3.2	18.2	18.9
5	17 37 0.41	7.09	1.40	27 57 46.6	1.9	18.5	19.2
6	17 39 47.94	6.86	1.42	27 58 18.0	- 0.7	18.8	19.5
7	17 42 29.76	6.62	1.44	27 58 19.5	+ 0.6	19.0	19.8
8	17 45 5.59	6.36	1.46	27 57 51.5	1.8	19.3	20.1
9	17 47 35.16	6.10	1.48	27 56 54.2	3.0	19.6	20.4
10	17 49 58.18	5.82	1.51	27 55 28.2	4.2	20.0	20.8
11	17 52 14.35	5.52	1.54	27 53 33.5	5.4	20.3	21.1
12	17 54 23.37	5.21	1.56	27 51 10.4	6.6	20.7	21.5
13	17 56 24.94	4.90	1.58	27 48 19.0	7.7	21.0	21.8
14	17 58 18.78	4.57	1.61	27 44 59.7	8.9	21.4	22.2
15	18 0 4.56	4.23	1.64	27 41 12.9	10.0	21.7	22.6
16	18 1 41.99	3.88	1.67	27 36 58.7	11.2	22.1	23.0
17	18 3 10.81	3.52	1.70	27 32 16.8	12.3	22.4	23.3
18	18 4 30.73	3.14	1.72	27 27 7.5	13.5	22.8	23.7
19	18 5 41.46	2.75	1.75	27 21 30.7	14.6	23.2	24.1
20	18 6 42.72	2.35	1.78	27 15 26.7	15.8	23.6	24.5
21	18 7 34.26	1.94	1.81	27 8 55.1	16.9	24.0	24.9
22	18 8 15.87	1.52	1.83	27 1 56.0	18.1	24.3	25.3
23	18 8 47.31	1.09	1.86	26 54 29.2	19.2		25.7
24	18 9 8.40	0.66	1.89	26 46 34.5	20.4		26.2
25	18 9 18.98	+ 0.22	1.92	26 38 11.7			
26	18 9 18.91	- 0.23	1.94	26 29 20.6			
27	18 9 8.11	0.68	1.96	26 20 0.7			
28	18 8 46.50	1.13	1.98	26 10 11.7			
29	18 8 14.07	1.58	2.01	25 59 53.2			
30	18 7 30.86	2.02	2.04	25 49 5.4			
31	18 6 36.93	- 2.47	2.07	S. 25 37 47.8			

## DECEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lat.
	Noon.	Noon.	Noon.		Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	18 6 40.48	S. 25 38 29.5	9.4709980	1 26.4	59 58 58.4	S. 0 53 56.3	9.81
2	18 5 36.38	25 26 41.4	.4652665	1 21.4	61 35 26.4	0 48 24.3	.81
3	18 4 21.85	25 14 23.0	.4597869	1 16.2	63 11 56.2	0 42 49.9	.81
4	18 2 57.19	25 1 34.5	.4545829	1 10.9	64 48 27.7	0 37 13.3	.81
5	18 1 22.75	24 48 16.1	.4496783	1 5.4	66 25 1.1	0 31 34.9	.81
6	17 59 38.96	24 34 28.4	.4450971	0 59.7	68 1 36.2	0 25 54.8	.81
7	17 57 46.37	24 20 12.3	.4408637	0 53.9	69 38 13.2	0 20 13.4	.81
8	17 55 45.59	24 5 28.7	.4370020	0 48.0	71 14 52.0	0 14 30.9	.81
9	17 53 37.32	23 50 19.3	.4335343	0 42.0	72 51 32.6	0 8 47.6	.81
10	17 51 22.33	23 34 45.9	.4304815	0 35.8	74 28 14.9	S. 0 3 3.8	.81
11	17 49 1.48	23 18 50.8	.4278636	0 29.5	76 4 39.1	N. 0 2 40.2	.81
12	17 46 35.69	23 2 36.6	.4256981	0 23.2	77 41 45.1	0 8 24.2	.81
13	17 44 5.97	22 46 6.3	.4239996	0 16.8	79 18 32.8	0 14 7.9	.81
14	17 41 33.40	22 29 23.5	.4227793	0 10.3	80 55 22.3	0 19 51.1	.81
15	17 38 59.04	22 12 31.9	.4220469	{ <sup>0</sup> <sup>58</sup> <sup>3</sup> } { <sub>23</sub> <sub>57.9</sub> }	82 32 13.6	0 25 33.4	.81
16	17 36 23.96	21 55 35.7	.4218081	23 50.8	84 9 6.6	0 31 14.6	.81
17	17 33 49.30	21 38 39.5	.4220654	23 44.3	85 46 1.4	0 36 54.4	.81
18	17 31 16.19	21 21 48.2	.4228171	23 37.9	87 22 57.8	0 42 32.5	.81
19	17 28 45.69	21 5 6.3	.4240590	23 31.6	88 59 56.0	0 48 8.6	.81
20	17 26 18.82	20 48 38.5	.4257827	23 25.3	90 36 55.9	0 53 42.5	.81
21	17 23 56.57	20 32 29.5	.4279763	23 19.1	92 13 57.5	0 59 14.0	.81
22	17 21 39.85	20 16 44.3	.4306244	23 13.0	93 51 0.7	1 4 42.7	.81
23	17 19 29.51	20 1 27.2	.4337104	23 7.0	95 28 5.6	1 10 8.4	.81
24	17 17 26.33	19 46 42.1	.4372151	23 1.2	97 5 12.1	1 15 30.8	.81
25	17 15 30.98	19 32 32.8	.4411168	22 55.5	98 42 20.2	1 20 49.7	.81
26	17 13 44.04	19 19 2.8	.4453919	22 49.9	100 19 29.9	1 26 4.7	.81
27	17 12 6.02	19 6 14.9	.4500168	22 44.5	101 56 41.1	1 31 15.7	.81
28	17 10 37.33	18 54 11.4	.4549671	22 39.3	103 33 53.8	1 36 22.4	.81
29	17 9 18.27	18 42 54.3	.4602182	22 34.2	105 11 7.9	1 41 24.5	.81
30	17 8 9.08	18 32 25.3	.4657457	22 29.3	106 48 23.4	1 46 21.8	.81
31	17 7 9.94	18 22 45.4	.4715247	22 24.5	108 25 40.3	1 51 14.0	.81
32	17 6 20.97	S. 18 13 54.9	9.4775310	22 19.9	110 2 58.5	N. 1 56 0.9	9.81



DECEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	18 6 36.93	— 2.47	2.07	S. 25 37 47.8	+ 28.9	27.9	29.0
2	18 5 32.45	2.90	2.09	25 26 0.4	30.1	28.3	29.4
3	18 4 17.62	3.33	2.11	25 13 43.0	31.3	28.7	29.8
4	18 2 52.77	3.74	2.13	25 0 55.9	32.6	29.0	30.1
5	18 1 18.23	4.13	2.16	24 47 39.1	33.8	29.3	30.5
6	17 59 34.46	4.51	2.17	24 33 53.5	35.0	29.6	30.8
7	17 57 41.99	4.85	2.18	24 19 39.7	36.1	29.9	31.1
8	17 55 41.44	5.18	2.20	24 4 58.8	37.2	30.1	31.3
9	17 53 33.48	5.47	2.22	23 49 52.4	38.3	30.4	31.6
10	17 51 18.90	5.73	2.23	23 34 22.4	39.2	30.6	31.8
11	17 48 58.53	5.95	2.24	23 18 31.0	40.0	30.8	32.0
12	17 46 33.30	6.13	2.25	23 2 20.8	40.7	31.0	32.2
13	17 44 4.20	6.27	2.26	22 45 54.7	41.3	31.1	32.3
14	17 41 32.30	6.37	2.26	22 29 16.3	41.7	31.2	32.4
15	{ 17 39 30.32 } { 17 39 30.32 }	{ 6.42 } { 6.42 }	{ 2.25 } { 2.25 }	{ 22 12 22.8 } { 22 12 22.8 }	{ 42.1 } { 42.2 }	{ 31.3 } { 31.3 }	{ 32.5 } { 32.5 }
16	17 33 50.28	6.38	2.24	21 38 46.0	42.1	31.3	32.5
17	17 31 17.84	6.30	2.23	21 21 59.1	41.8	31.2	32.4
18	17 28 47.97	6.17	2.22	21 5 21.5	41.3	31.2	32.4
19	17 26 21.68	6.00	2.21	20 48 57.8	40.6	31.0	32.2
20	17 23 59.94	5.79	2.19	20 32 52.6	39.7	30.8	32.0
21	17 21 43.65	5.55	2.17	20 17 10.8	38.6	30.6	31.8
22	17 19 33.65	5.27	2.16	20 1 56.6	37.4	30.4	31.6
23	17 17 30.73	4.96	2.14	19 47 14.0	36.0	30.2	31.4
24	17 15 35.53	4.63	2.12	19 33 6.8	34.5	30.0	31.2
25	17 13 48.65	4.27	2.09	19 19 38.3	32.8	29.8	31.0
26	17 12 10.58	3.89	2.07	19 6 51.3	31.0	29.6	30.8
27	17 10 41.75	3.50	2.05	18 54 48.3	29.1	29.4	30.6
28	17 9 22.45	3.10	2.03	18 43 31.0	27.2	29.2	30.4
29	17 8 12.92	2.69	2.00	18 33 1.0	25.2	29.0	30.2
30	17 7 13.37	2.27	1.97	18 23 20.8	23.2	28.8	30.0
31	17 6 23.90	1.85	1.93	18 14 28.8	21.1	28.6	29.8
32	17 5 44.58	— 1.43	1.90	S. 18 6 26.7	19.0	28.4	29.6

## JANUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. V.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<i>h m s</i>	<i>° ' "</i>		<i>h m</i>	<i>° ' "</i>	<i>° ' "</i>	
1	5 21 23.8	N.26 29 4.5	9.7950597	10 35.6	93 15 2.0	N.1 18 27.7	0.19984
2	5 19 45.12	26 28 20.5	.7980264	10 30.4	93 43 58.2	1 19 7.2	.20013
3	5 18 30.94	26 27 32.3	.8011004	10 25.3	94 12 52.0	1 19 46.4	.20046
4	5 17 19.93	26 26 40.4	.8042774	10 20.2	94 41 43.4	1 20 25.2	.20076
5	5 16 12.19	26 25 45.4	.8075532	10 15.2	95 10 32.3	1 21 3.5	.20107
6	5 15 7.78	26 24 47.7	.8109234	10 10.2	95 39 18.8	1 21 41.5	.20137
7	5 14 6.79	26 23 47.8	.8143832	10 5.3	96 8 3.0	1 22 19.1	.20167
8	5 13 9.27	26 22 46.0	.8179283	10 0.4	96 36 44.8	1 22 56.3	.20197
9	5 12 15.28	26 21 43.0	.8215542	9 55.6	97 5 24.2	1 23 33.1	.20227
10	5 11 24.87	26 20 39.0	.8252565	9 50.9	97 34 1.3	1 24 9.5	.20257
11	5 10 38.07	26 19 34.5	.8290306	9 46.2	98 2 36.1	1 24 45.5	.20287
12	5 9 54.93	26 18 29.9	.8328722	9 41.6	98 31 8.6	1 25 21.1	.20317
13	5 9 15.46	26 17 25.6	.8367765	9 37.0	98 59 38.8	1 25 56.3	.20347
14	5 8 39.66	26 16 22.0	.8407392	9 32.5	99 28 6.8	1 26 31.1	.20377
15	5 8 7.54	26 15 19.3	.8447560	9 28.1	99 56 32.5	1 27 5.5	.20407
16	5 7 39.11	26 14 17.8	.8488225	9 23.7	100 24 56.0	1 27 39.5	.20437
17	5 7 14.35	26 13 17.9	.8529348	9 19.4	100 53 17.2	1 28 13.1	.20467
18	5 6 53.26	26 12 19.9	.8570881	9 15.1	101 21 36.3	1 28 46.3	.20497
19	5 6 35.80	26 11 23.9	.8612790	9 10.9	101 49 53.3	1 29 19.1	.20527
20	5 6 21.94	26 10 30.1	.8655038	9 6.8	102 18 8.1	1 29 51.5	.20557
21	5 6 11.64	26 9 38.6	.8697588	9 2.7	102 46 20.7	1 30 23.4	.20587
22	5 6 4.86	26 8 49.6	.8740405	8 58.7	103 14 31.3	1 30 55.0	.20617
23	5 6 1.57	26 8 3.2	.8783458	8 54.7	103 42 39.7	1 31 26.2	.20647
24	5 6 1.70	26 7 19.5	.8826708	8 50.8	104 10 46.1	1 31 57.0	.20677
25	5 6 5.21	26 6 38.6	.8870132	8 46.9	104 38 50.4	1 32 27.3	.20707
26	5 6 12.05	26 6 0.4	.8913702	8 43.1	105 6 52.7	1 32 57.3	.20737
27	5 6 22.16	26 5 24.9	.8957392	8 39.4	105 34 52.9	1 33 26.9	.20767
28	5 6 35.49	26 4 52.1	.9001177	8 35.7	106 2 51.2	1 33 56.0	.20797
29	5 6 51.99	26 4 22.1	.9045034	8 32.1	106 30 47.5	1 34 24.8	.20827
30	5 7 11.57	26 3 54.7	.9088939	8 28.5	106 58 41.8	1 34 53.1	.20857
31	5 7 34.20	26 3 29.8	.9132875	8 24.9	107 26 34.2	1 35 21.0	.20887
32	5 7 59.83	N.26 3 7.5	9.9176820	8 21.4	107 54 24.6	N.1 35 48.6	.20917



## JANUARY, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	5 20 27.90	- 3.21	0.53	N. 26 28 45.7	- 1.8	7.1	13.7
2	5 19 12.26	3.09	0.53	26 27 59.9	2.0	7.1	13.7
3	5 17 59.71	2.96	0.52	26 27 10.2	2.1	7.0	13.6
4	5 16 50.35	2.82	0.52	26 26 17.1	2.3	7.0	13.5
5	5 15 44.27	2.68	0.51	26 25 21.0	2.4	6.9	13.4
6	5 14 41.52	2.54	0.51	26 24 22.5	2.5	6.9	13.3
7	5 13 42.19	2.40	0.51	26 23 22.0	2.6	6.8	13.2
8	5 12 46.33	2.25	0.50	26 22 19.9	2.6	6.7	13.0
9	5 11 53.99	2.11	0.50	26 21 16.6	2.7	6.7	12.9
10	5 11 5.22	1.96	0.49	26 20 12.6	2.7	6.6	12.8
11	5 10 20.06	1.81	0.49	26 19 8.2	2.7	6.6	12.7
12	5 9 38.54	1.65	0.48	26 18 3.9	2.7	6.5	12.6
13	5 9 0.67	1.50	0.48	26 17 0.0	2.6	6.5	12.5
14	5 8 26.45	1.35	0.48	26 15 56.9	2.6	6.4	12.4
15	5 7 55.89	1.20	0.47	26 14 54.9	2.6	6.4	12.3
16	5 7 28.98	1.05	0.47	26 13 54.2	2.5	6.3	12.1
17	5 7 5.72	0.89	0.46	26 12 55.1	2.4	6.2	12.0
18	5 6 46.10	0.74	0.46	26 11 58.0	2.3	6.2	11.9
19	5 6 30.08	0.59	0.45	26 11 3.0	2.2	6.1	11.8
20	5 6 17.61	0.45	0.45	26 10 10.2	2.1	6.1	11.7
21	5 6 8.67	0.30	0.45	26 9 19.8	2.0	6.0	11.6
22	5 6 3.22	0.16	0.44	26 8 31.9	1.9	6.0	11.5
23	5 6 1.22	- 0.01	0.44	26 7 46.6	1.8	5.9	11.4
24	5 6 2.61	+ 0.13	0.43	26 7 4.1	1.7	5.8	11.2
25	5 6	0.27	0.43	26 6 24.3	1.6	5.7	11.1
26	5	0.40	0.43	26 5 47.2	1.5	5.7	11.0
27	5	0.54	0.42	26 5 12.8	1.4	5.6	10.9
28			0.42	26 4 41.1	1.3	5.6	10.8
29			0.41	26 4 12.1	1.2	5.5	10.7
30				26 3 45.6	1.1	5.5	10.6
31				26 3 21.7	0.9	5.4	10.5
32				5 3 0.3	- 0.8	5.4	10.4

## FEBRUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. V.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	5 7 59.83	N.26 3 7.5	9.9176820	8 21.4	107 54 24.6	N.1 35 48.6	0.20855
2	5 8 28.41	26 2 47.6	.9220758	8 18.0	108 22 13.2	1 36 15.7	.20880
3	5 8 59.89	26 2 30.1	.9264669	8 14.6	108 49 59.8	1 36 42.4	.20904
4	5 9 34.21	26 2 14.8	.9308538	8 11.3	109 17 44.6	1 37 8.7	.20929
5	5 10 11.32	26 2 1.7	.9352352	8 8.0	109 45 27.5	1 37 34.6	.20953
6	5 10 51.17	26 1 50.6	.9396093	8 4.7	110 13 8.7	1 38 0.1	.20977
7	5 11 33.71	26 1 41.4	.9439746	8 1.5	110 40 48.0	1 38 25.1	.21000
8	5 12 18.89	26 1 34.0	.9483295	7 58.3	111 8 25.5	1 38 49.8	.21022
9	5 13 6.67	26 1 28.2	.9526726	7 55.2	111 36 1.2	1 39 14.1	.21044
10	5 13 56.99	26 1 24.0	.9570028	7 52.1	112 3 35.2	1 39 37.9	.21067
11	5 14 49.81	26 1 21.1	.9613189	7 49.1	112 31 7.4	1 40 1.4	.21090
12	5 15 45.07	26 1 19.4	.9656194	7 46.1	112 58 37.9	1 40 24.4	.21112
13	5 16 42.72	26 1 18.7	.9699032	7 43.1	113 26 6.7	1 40 47.0	.21135
14	5 17 42.71	26 1 18.9	.9741692	7 40.2	113 53 33.8	1 41 9.2	.21158
15	5 18 44.98	26 1 19.9	.9784163	7 37.3	114 20 59.3	1 41 31.0	.21180
16	5 19 49.48	26 1 21.5	.9826436	7 34.5	114 48 23.1	1 41 52.4	.21203
17	5 20 56.17	26 1 23.5	.9868499	7 31.6	115 15 45.3	1 42 13.4	.21225
18	5 22 4.99	26 1 25.7	.9910347	7 28.8	115 43 5.8	1 42 34.0	.21248
19	5 23 15.88	26 1 27.9	.9951971	7 26.1	116 10 24.8	1 42 54.1	.21270
20	5 24 28.79	26 1 29.9	.9993366	7 23.4	116 37 42.2	1 43 13.9	.21293
21	5 25 43.67	26 1 31.6	0.0034525	7 20.7	117 4 58.0	1 43 33.2	.21315
22	5 27 0.48	26 1 32.7	.0075442	7 18.1	117 32 12.3	1 43 52.2	.21338
23	5 28 19.15	26 1 33.0	.0116111	7 15.5	117 59 25.1	1 44 10.7	.21360
24	5 29 39.64	26 1 32.3	.0156531	7 12.9	118 26 36.4	1 44 28.8	.21383
25	5 31 1.91	26 1 30.4	.0196700	7 10.3	118 53 46.2	1 44 46.5	.21405
26	5 32 25.91	26 1 27.2	.0236614	7 7.8	119 20 54.5	1 45 3.8	.21428
27	5 33 51.60	26 1 22.5	.0276271	7 5.3	119 48 1.4	1 45 20.7	.21450
28	5 35 18.93	26 1 16.0	.0315669	7 2.8	120 15 6.9	1 45 37.2	.21473
29	5 36 47.86	N.26 1 7.6	0.0354809	7 0.3	120 42 11.0	N.1 45 53.3	0.21495



## FEBRUARY, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	5 8 9.45	+ 1.17	0.40	N. 26 3 0.3	- 0.8	5.4	10.4
2	5 8 38.98	1.29	0.39	26 2 41.3	0.7	5.3	10.3
3	5 9 11.36	1.41	0.39	26 2 24.6	0.7	5.3	10.2
4	5 9 46.56	1.52	0.39	26 2 10.1	0.6	5.2	10.1
5	5 10 24.52	1.64	0.38	26 1 57.7	0.5	5.2	10.0
6	5 11 5.19	1.75	0.38	26 1 47.3	0.4	5.1	9.9
7	5 11 48.52	1.86	0.38	26 1 38.7	0.3	5.1	9.8
8	5 12 34.48	1.97	0.37	26 1 31.9	0.3	5.0	9.7
9	5 13 23.00	2.07	0.37	26 1 26.7	0.2	5.0	9.6
10	5 14 14.03	2.18	0.36	26 1 22.9	0.1	4.9	9.5
11	5 15 7.54	2.28	0.36	26 1 20.4	- 0.1	4.9	9.4
12	5 16 3.47	2.38	0.36	26 1 19.0	0.0	4.8	9.3
13	5 17 1.76	2.48	0.35	26 1 18.7	0.0	4.8	9.2
14	5 18 2.36	2.57	0.35	26 1 19.2	0.0	4.7	9.1
15	5 19 5.22	2.67	0.34	26 1 20.4	+ 0.1	4.7	9.0
16	5 20 10.29	2.76	0.34	26 1 22.1	0.1	4.6	8.9
17	5 21 17.53	2.85	0.34	26 1 24.2	0.1	4.6	8.8
18	5 22 26.86	2.93	0.33	26 1 26.4	0.1	4.5	8.7
19	5 23 38.25	3.02	0.33	26 1 28.6	0.1	4.5	8.7
20	5 24 51.64	3.10	0.33	26 1 30.5	+ 0.1	4.4	8.6
21	5 26 6.98	3.18	0.32	26 1 32.0	0.0	4.4	8.5
22	5 27 24.22	3.26	0.32	26 1 32.9	0.0	4.3	8.4
23	5 28 43.30	3.33	0.32	26 1 32.9	0.0	4.3	8.4
24	5 30 4.19	3.41	0.31	26 1 31.9	- 0.1	4.3	8.3
25	5 31 26.84	3.48	0.31	26 1 29.6	0.1	4.2	8.2
26	5 32 51.19	3.55	0.31	26 1 26.0	0.2	4.2	8.1
27	5 34 17.22	3.62	0.30	26 1 20.8	0.3	4.1	8.0
28	5 35 44.88	3.69	0.30	26 1 13.8	0.3	4.0	8.0
29	5 37 14.12	+ 3.75	0.30	N. 26 1 4.8	0.4		7.9

## MARCH, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	5 36 47.86	N.26 1 7.6	0.0354809	7 0.3	120 42 11.0	N.1 45 53.3	0.214
2	5 38 18.35	26 0 57.1	.0393689	6 57.9	121 9 13.7	1 46 8.9	.214
3	5 39 50.38	26 0 44.3	.0432306	6 55.5	121 36 15.1	1 46 24.2	.215
4	5 41 23.90	26 0 29.1	.0470660	6 53.2	122 3 15.1	1 46 39.0	.215
5	5 42 58.89	26 0 11.3	.0508750	6 50.8	122 30 13.8	1 46 53.5	.215
6	5 44 35.31	25 59 50.7	.0546574	6 48.5	122 57 11.2	1 47 7.5	.215
7	5 46 13.13	25 59 27.1	.0584134	6 46.2	123 24 7.3	1 47 21.2	.2157
8	5 47 52.32	25 59 0.4	.0621428	6 43.9	123 51 2.1	1 47 34.4	.2159
9	5 49 32.85	25 58 30.5	.0658452	6 41.6	124 17 55.6	1 47 47.2	.216
10	5 51 14.69	25 57 57.1	.0695206	6 39.4	124 44 48.0	1 47 59.7	.216
11	5 52 57.81	25 57 20.2	.0731688	6 37.2	125 11 39.1	1 48 11.7	.216
12	5 54 42.17	25 56 39.5	.0767898	6 35.0	125 38 29.0	1 48 23.3	.216
13	5 56 27.76	25 55 55.0	.0803835	6 32.8	126 5 17.7	1 48 34.5	.216
14	5 58 14.53	25 55 6.4	.0839496	6 30.7	126 32 5.3	1 48 45.4	.216
15	6 0 2.49	25 54 13.7	.0874880	6 28.5	126 58 51.7	1 48 55.8	.217
16	6 1 51.56	25 53 16.7	.0909988	6 26.4	127 25 37.0	1 49 5.8	.217
17	6 3 41.72	25 52 15.3	.0944817	6 24.3	127 52 21.2	1 49 15.4	.217
18	6 5 32.95	25 51 9.3	.0979368	6 22.2	128 19 4.3	1 49 24.6	.217
19	6 7 25.22	25 49 58.6	.1013637	6 20.2	128 45 46.4	1 49 33.4	.217
20	6 9 18.49	25 48 43.1	.1047628	6 18.1	129 12 27.4	1 49 41.9	.217
21	6 11 12.73	25 47 22.7	.1081341	6 16.1	129 39 7.4	1 49 49.9	.217
22	6 13 7.92	25 45 57.1	.1114778	6 14.1	130 5 46.4	1 49 57.5	.218
23	6 15 4.02	25 44 26.3	.1147939	6 12.1	130 32 24.4	1 50 4.7	.218
24	6 17 1.01	25 42 50.2	.1180825	6 10.1	130 59 1.4	1 50 11.5	.218
25	6 18 58.85	25 41 8.6	.1213438	6 8.1	131 25 37.5	1 50 17.9	.218
26	6 20 57.52	25 39 21.4	.1245781	6 6.2	131 52 12.7	1 50 23.9	.218
27	6 22 56.99	25 37 28.5	.1277855	6 4.2	132 18 46.9	1 50 29.5	.218
28	6 24 57.25	25 35 29.8	.1309662	6 2.3	132 45 20.2	1 50 34.7	.218
29	6 26 58.28	25 33 25.2	.1341205	6 0.4	133 11 52.7	1 50 39.5	.218
30	6 29 0.04	25 31 14.6	.1372485	5 58.5	133 38 24.3	1 50 43.9	.219
31	6 31 2.52	25 28 57.9	.1403506	5 56.6	134 4 55.1	1 50 47.9	.219
32	6 33 5.70	N.25 26 35.0	0.1434269	5 54.7	134 31 25.1	N.1 50 51.5	0.219



## MARCH, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
5 37 14.12	+ 3.75	0.30	N.26 1 4.8	- 0.4	4.1	7.9
5 38 44.91	3.81	0.30	26 0 53.7	0.5	4.0	7.8
5 40 17.22	3.88	0.30	26 0 40.2	0.6	4.0	7.8
5 41 51.01	3.94	0.29	26 0 24.3	0.7	4.0	7.7
5 43 26.26	4.00	0.29	26 0 5.7	0.8	3.9	7.6
5 45 2.92	4.06	0.29	25 59 44.3	1.0	3.9	7.6
5 46 40.97	4.11	0.29	25 59 20.0	1.1	3.9	7.5
5 48 20.38	4.17	0.28	25 58 52.4	1.2	3.8	7.4
5 50 1.12	4.22	0.28	25 58 21.5	1.4	3.8	7.4
5 51 43.16	4.28	0.28	25 57 47.2	1.5	3.8	7.3
5 53 26.47	4.33	0.27	25 57 9.3	1.7	3.7	7.2
5 55 11.01	4.38	0.27	25 56 27.7	1.8	3.7	7.2
5 56 56.77	4.43	0.27	25 55 42.1	2.0	3.7	7.1
5 58 43.72	4.48	0.27	25 54 52.5	2.2	3.7	7.1
6 0 31.81	4.53	0.27	25 53 58.8	2.3	3.6	7.0
6 2 21.01	4.57	0.26	25 53 0.7	2.5	3.6	7.0
6 4 11.30	4.62	0.26	25 51 58.1	2.7	3.6	6.9
6 6 2.65	4.66	0.26	25 50 51.0	2.9	3.5	6.8
6 7 55.02	4.70	0.26	25 49 39.2	3.1	3.5	6.8
6 9 48.39	4.74	0.26	25 48 22.5	3.3	3.5	6.7
6 11 42.73	4.78	0.26	25 47 0.9	3.5	3.5	6.7
6 13 38.00	4.82	0.25	25 45 34.1	3.7	3.4	6.6
6 15 34.17	4.86	0.25	25 44 2.0	3.9	3.4	6.6
6 17 31.22	4.89	0.25	25 42 24.6	4.2	3.4	6.5
6 19 29.11	4.93	0.25	25 40 41.7	4.4		
6 21 27.82	4.96	0.24	25 38 53.2			
6 23 27.34	5.00	0.24	25 36 59.0			
6 25 27.63	5.03	0.24	25 34 50.0			
6 27 28.68	5.06	0.24	25 32 5.0			
6 29 30.46	5.09	0.24	25 30 4.0			
6 31 32.95	5.12	0.24	25 28 5.0			
6 33 36.14	+ 5.15	0.24	N.25 25			

APRIL, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.			
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.	
	Noon.	Noon.	Noon.		Noon.	Noon.	No.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>			<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	6 33 57.0	N.25 26 35.0	0.1434269	5 54.7	134 31 25.1	N.1 50 51.5	0.219	
2	6 35 9.56	25 24 5.9	.1464776	5 52.8	134 57 54.3	1 50 54.8	.219	
3	6 37 14.08	25 21 30.4	.1495027	5 50.9	135 24 22.7	1 50 57.6	.219	
4	6 39 19.25	25 18 48.4	.1525026	5 49.1	135 50 50.3	1 51 0.0	.219	
5	6 41 25.05	25 15 59.9	.1554773	5 47.2	136 17 17.1	1 51 2.0	.219	
6	6 43 31.46	25 13 4.8	.1584272	5 45.4	136 43 43.2	1 51 3.6	.219	
7	6 45 38.48	25 10 2.9	.1613521	5 43.6	137 10 8.6	1 51 4.8	.219	
8	6 47 46.07	25 6 54.3	.1642522	5 41.8	137 36 33.3	1 51 5.7	.219	
9	6 49 54.22	25 3 38.9	.1671275	5 40.0	138 2 57.3	1 51 6.1	.220	
10	6 52 2.92	25 0 16.6	.1699780	5 38.2	138 29 20.7	1 51 6.1	.220	
11	6 54 12.15	24 56 47.4	.1728040	5 36.4	138 55 43.5	1 51 5.8	.220	
12	6 56 21.90	24 53 11.2	.1756054	5 34.6	139 22 5.6	1 51 5.0	.220	
13	6 58 32.15	24 49 27.9	.1783822	5 32.9	139 48 27.1	1 51 3.9	.220	
14	7 0 42.87	24 45 37.5	.1811345	5 31.1	140 14 48.1	1 51 2.4	.220	
15	7 2 54.05	24 41 40.0	.1838625	5 29.3	140 41 8.5	1 51 0.5	.220	
16	7 5 5.67	24 37 35.3	.1865662	5 27.6	141 7 28.4	1 50 58.2	.220	
17	7 7 17.71	24 33 23.3	.1892457	5 25.9	141 33 47.7	1 50 55.5	.220	
18	7 9 30.16	24 29 4.1	.1919009	5 24.1	142 0 6.5	1 50 52.4	.220	
19	7 11 42.99	24 24 37.6	.1945322	5 22.4	142 26 24.9	1 50 49.0	.220	
20	7 13 56.18	24 20 3.7	.1971399	5 20.7	142 52 42.8	1 50 45.2	.220	
21	7 16 9.73	24 15 22.5	.1997240	5 19.0	143 19 0.3	1 50 41.0	.220	
22	7 18 23.61	24 10 33.8	.2022848	5 17.3	143 45 17.3	1 50 36.4	.220	
23	7 20 37.81	24 5 37.7	.2048225	5 15.6	144 11 33.9	1 50 31.4	.220	
24	7 22 52.30	24 0 34.1	.2073373	5 13.9	144 37 50.1	1 50 26.0	.220	
25	7 25 7.08	23 55 23.0	.2098296	5 12.2	145 4 6.0	1 50 20.3	.220	
26	7 27 22.14	23 50 4.4	.2122994	5 10.5	145 30 21.5	1 50 14.1	.220	
27	7 29 37.46	23 44 38.2	.2147471	5 8.8	145 56 36.7	1 50 7.6	.220	
28	7 31 53.04	23 39 4.5	.2171729	5 7.1	146 22 51.5	1 50 0.7	.220	
29	7 34 8.86	23 33 23.2	.2195770	5 5.4	146 49 6.1	1 49 53.4	.220	
30	7 36 24.91	23 27 34.3	.2219597	5 3.8	147 15 20.4	1 49 45.7	.220	
31	7 38 41.18	N.23 21 37.7	0.2243212	5 2.1	147 41 34.4	N.1 49 37.7	0.220	



## APRIL, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
6 33 36.14	+ 5.15	0.24	N. 25 25 58.9	- 6.1	3.2	6.2
6 35 40.01	5.17	0.23	25 23 28.4	6.4	3.2	6.1
6 37 44.53	5.20	0.23	25 20 51.5	6.7	3.2	6.1
6 39 49.69	5.23	0.23	25 18 8.2	6.9	3.1	6.0
6 41 55.48	5.25	0.23	25 15 18.3	7.2	3.1	6.0
6 44 1.88	5.28	0.23	25 12 21.8	7.5	3.1	6.0
6 46 8.87	5.30	0.23	25 9 18.6	7.8	3.1	5.9
6 48 16.43	5.33	0.23	25 6 8.6	8.1	3.1	5.9
6 50 24.56	5.35	0.22	25 2 51.8	8.4	3.0	5.8
6 52 33.23	5.37	0.22	24 59 28.1	8.6	3.0	5.8
6 54 42.42	5.39	0.22	24 55 57.5	8.9	3.0	5.8
6 56 52.12	5.41	0.22	24 52 19.9	9.2	3.0	5.7
6 59 2.32	5.43	0.22	24 48 35.2	9.5	3.0	5.7
7 1 12.99	5.45	0.22	24 44 43.5	9.8	3.0	5.7
7 3 24.11	5.47	0.21	24 40 44.6	10.1	2.9	5.6
7 5 35.67	5.49	0.21	24 36 38.6	10.4	2.9	5.6
7 7 47.65	5.51	0.21	24 32 25.3	10.7	2.9	5.6
7 10 0.02	5.52	0.21	24 28 4.7	11.0	2.9	5.5
7 12 12.77	5.54	0.21	24 23 36.9	11.3	2.8	5.5
7 14 25.89	5.55	0.21	24 19 1.7	11.6	2.8	5.5
7 16 39.36	5.57	0.20	24 14 19.2	11.9	2.8	5.4
7 18 53.15	5.58	0.20	24 9 29.2	12.2	2.8	5.4
7 21 7.26	5.59	0.20	24 4 31.8	12.5	2.8	5.4
7 23 21.66	5.61	0.20	23 59 26.9	12.9	2.7	5.3
7 25 36.34	5.62	0.20	23 54 14.6	13.2		
7 27 51.30	5.63	0.20	23 48 54.7	13		
7 30 6.52	5.64	0.20	23 43 27.3	13		
7 32 21.99	5.65	0.20	23 37 52.4			
7 34 37.70	5.66	0.20	23 32 9.8			
7 36 53.63	5.67	0.19	23 26 19.7			
7 39 9.79	+ 5.68	0.19	N. 23 20 22.0			

MAY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.			
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	L Rad.	
	Noon.	Noon.	Noon.		Noon.	Noon.		
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		
1	7 38 41.18	N.23 21 37.7	0.2243212	5 2.1	147 41 34.4	N.1 49 37.7	0.21	
2	7 40 57.66	23 15 33.5	.2266614	5 0.4	148 7 48.2	1 49 29.2	.21	
3	7 43 14.35	23 9 21.7	.2289807	4 58.8	148 34 1.7	1 49 20.4	.21	
4	7 45 31.24	23 3 2.3	.2312791	4 57.1	149 0 15.1	1 49 11.2	.21	
5	7 47 48.31	22 56 35.2	.2335567	4 55.5	149 26 28.3	1 49 1.6	.21	
6	7 50 5.57	22 50 0.4	.2358138	4 53.8	149 52 41.3	1 48 51.6	.21	
7	7 52 23.00	22 43 18.0	.2380504	4 52.2	150 18 54.1	1 48 41.3	.21	
8	7 54 40.60	22 36 28.0	.2402664	4 50.5	150 45 6.8	1 48 30.5	.21	
9	7 56 58.35	22 29 30.3	.2424621	4 48.9	151 11 19.4	1 48 19.4	.21	
10	7 59 16.25	22 22 25.0	.2446374	4 47.2	151 37 31.9	1 48 8.0	.21	
11	8 1 34.29	22 15 12.1	.2467925	4 45.6	152 3 44.4	1 47 56.1	.21	
12	8 3 52.46	22 7 51.6	.2489274	4 44.0	152 29 56.8	1 47 43.9	.21	
13	8 6 10.74	22 0 23.5	.2510421	4 42.3	152 56 9.1	1 47 31.3	.21	
14	8 8 29.13	21 52 47.9	.2531367	4 40.7	153 22 21.4	1 47 18.3	.21	
15	8 10 47.62	21 45 4.7	.2552115	4 39.1	153 48 33.8	1 47 4.9	.21	
16	8 13 6.20	21 37 14.0	.2572664	4 37.4	154 14 46.1	1 46 51.2	.21	
17	8 15 24.85	21 29 15.8	.2593015	4 35.8	154 40 58.5	1 46 37.1	.21	
18	8 17 43.57	21 21 10.2	.2613168	4 34.2	155 7 10.9	1 46 22.6	.21	
19	8 20 2.35	21 12 57.1	.2633127	4 32.5	155 33 23.4	1 46 7.8	.21	
20	8 22 21.17	21 4 36.6	.2652893	4 30.9	155 59 36.0	1 45 52.6	.21	
21	8 24 40.04	20 56 8.7	.2672468	4 29.3	156 25 48.7	1 45 37.0	.21	
22	8 26 58.94	20 47 33.5	.2691855	4 27.7	156 52 1.6	1 45 21.0	.21	
23	8 29 17.87	20 38 50.9	.2711054	4 26.0	157 18 14.6	1 45 4.7	.21	
24	8 31 36.81	20 30 1.1	.2730069	4 24.4	157 44 27.8	1 44 48.0	.21	
25	8 33 55.77	20 21 4.0	.2748901	4 22.8	158 10 41.1	1 44 30.9	.21	
26	8 36 14.74	20 11 59.7	.2767552	4 21.2	158 36 54.7	1 44 13.5	.21	
27	8 38 33.71	20 2 48.2	.2786023	4 19.5	159 3 8.5	1 43 55.7	.21	
28	8 40 52.69	19 53 29.6	.2804317	4 17.9	159 29 22.5	1 43 37.6	.21	
29	8 43 11.67	19 44 3.8	.2822435	4 16.3	159 55 36.8	1 43 19.1	.21	
30	8 45 30.64	19 34 31.0	.2840380	4 14.7	160 21 51.4	1 43 0.2	.21	
31	8 47 49.61	19 24 51.1	.2858151	4 13.0	160 48 6.2	1 42 40.9	.21	
32	8 50 8.57	N.19 15 4.2	0.2875750	4 11.4	161 14 21.4	N.1 42 21.3	0.21	



MAY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup>	<sup>°</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
7 39 9.79	+ 5.68	0.19	N. 23 20 22.0	-15.1	2.6	5.1
7 41 26.16	5.69	0.19	23 14 16.6	15.4	2.6	5.1
7 43 42.73	5.69	0.19	23 8 3.6	15.7	2.6	5.1
7 45 59.50	5.70	0.19	23 1 43.0	16.0	2.6	5.0
7 48 16.46	5.71	0.19	22 55 14.8	16.3	2.6	5.0
7 50 33.60	5.72	0.19	22 48 39.0	16.7	2.6	5.0
7 52 50.91	5.72	0.19	22 41 55.5	17.0	2.6	5.0
7 55 8.38	5.73	0.18	22 35 4.3	17.3	2.5	4.9
7 57 26.00	5.74	0.18	22 28 5.6	17.6	2.5	4.9
7 59 43.77	5.74	0.18	22 20 59.3	17.9	2.5	4.9
8 2 1.68	5.75	0.18	22 13 45.4	18.2	2.5	4.9
8 4 19.72	5.75	0.18	22 6 23.9	18.6	2.5	4.8
8 6 37.87	5.76	0.18	21 58 54.8	18.9	2.5	4.8
8 8 56.12	5.76	0.18	21 51 18.2	19.2	2.5	4.8
8 11 14.47	5.77	0.18	21 43 34.1	19.5	2.5	4.8
8 13 32.90	5.77	0.17	21 35 42.5	19.8	2.4	4.7
8 15 51.41	5.77	0.17	21 27 43.4	20.1	2.4	4.7
8 18 9.98	5.77	0.17	21 19 36.9	20.4	2.4	4.7
8 20 28.61	5.78	0.17	21 11 22.9	20.7	2.4	4.7
8 22 47.29	5.78	0.17	21 3 1.6	21.0	2.4	4.7
8 25 6.01	5.78	0.17	20 54 32.9	21.3	2.4	4.6
8 27 24.76	5.78	0.17	20 45 56.9	21.7	2.4	4.6
8 29 43.54	5.78	0.17	20 37 13.6	22.0	2.4	4.6
8 32 2.33	5.78	0.17	20 28 23.0	22.3	2.4	4.6
8 34 21.13	5.78	0.17	20 19 25.2	22	2.4	4.6
8 36 39.94	5.78	0.16	20 10 20.2	!		4.5
8 38 58.76	5.78	0.16	20 1 8.0			4.5
8 41 17.59	5.78	0.16	19 51 48.2			
8 43 36.41	5.78	0.16	19 42 22			
8 45 55.22	5.78	0.16	19 32 48			
8 48 14.03	5.78	0.16	19 23 8			
8 50 32.83	+ 5.78	0.16	N. 19 13 21			

JUNE, 1850.

MEAN TIME.

Day of the Month	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	I. Ra
	Noon.	Noon.	Noon.		Noon.	Noon.	
	h m s	° ' "		h m	° ' "	° ' "	
1	8 50 8.57	N.19 15 4.20	.2875750	4 11.4	161 14 21.4	N.1 42 21.3	0.2
2	8 52 27.52	19 5 10.3	.2893178	4 9.8	161 40 36.9	1 42 1.3	.2
3	8 54 46.46	18 55 9.5	.2910436	4 8.2	162 6 52.8	1 41 41.0	.2
4	8 57 5.39	18 45 1.8	.2927525	4 6.5	162 33 9.0	1 41 20.3	.2
5	8 59 24.30	18 34 47.2	.2944446	4 4.9	162 59 25.6	1 40 59.2	.2
6	9 1 43.20	18 24 25.8	.2961198	4 3.3	163 25 42.6	1 40 37.8	.2
7	9 4 2.08	18 13 57.7	.2977783	4 1.6	163 52 0.0	1 40 16.1	.2
8	9 6 20.94	18 3 22.8	.2994200	4 0.0	164 18 17.9	1 39 54.0	.2
9	9 8 39.77	17 52 41.3	.3010450	3 58.4	164 44 36.2	1 39 31.5	.2
10	9 10 58.58	17 41 53.2	.3026533	3 56.8	165 10 55.0	1 39 8.6	.2
11	9 13 17.36	17 30 58.5	.3042449	3 55.1	165 37 14.3	1 38 45.4	.2
12	9 15 36.10	17 19 57.4	.3058200	3 53.5	166 3 34.1	1 38 21.9	.2
13	9 17 54.81	17 8 49.8	.3073785	3 51.9	166 29 54.5	1 37 58.0	.2
14	9 20 13.48	16 57 35.8	.3089207	3 50.3	166 56 15.4	1 37 33.7	.2
15	9 22 32.10	16 46 15.5	.3104467	3 48.6	167 22 36.9	1 37 9.1	.2
16	9 24 50.67	16 34 48.9	.3119564	3 47.0	167 48 59.0	1 36 44.1	.2
17	9 27 9.19	16 23 16.1	.3134500	3 45.4	168 15 21.7	1 36 18.8	.2
18	9 29 27.65	16 11 37.2	.3149276	3 43.7	168 41 45.0	1 35 53.1	.2
19	9 31 46.06	15 59 52.3	.3163895	3 42.1	169 8 9.0	1 35 27.1	.2
20	9 34 4.41	15 48 1.3	.3178358	3 40.5	169 34 33.6	1 35 0.7	.2
21	9 36 22.70	15 36 4.4	.3192666	3 38.8	170 0 59.0	1 34 34.0	.2
22	9 38 40.93	15 24 1.6	.3206820	3 37.2	170 27 25.0	1 34 6.9	.2
23	9 40 59.10	15 11 53.0	.3220823	3 35.6	170 53 51.8	1 33 39.5	.2
24	9 43 17.21	14 59 38.7	.3234676	3 33.9	171 20 19.3	1 33 11.7	.2
25	9 45 35.27	14 47 18.7	.3248380	3 32.3	171 46 47.6	1 32 43.6	.2
26	9 47 53.27	14 34 53.0	.3261936	3 30.6	172 13 16.7	1 32 15.1	.2
27	9 50 11.21	14 22 21.7	.3275346	3 29.0	172 39 46.5	1 31 46.3	.2
28	9 52 29.11	14 9 44.9	.3288611	3 27.4	173 6 17.2	1 31 17.2	.2
29	9 54 46.96	13 57 2.6	.3301733	3 25.7	173 32 48.7	1 30 47.7	.2
30	9 57 4.76	13 44 14.9	.3314712	3 24.1	173 59 21.1	1 30 17.9	.2
31	9 59 22.52	N.13 31 21.9	.3327548	3 22.4	174 25 54.4	N.1 29 47.8	0.2



## JUNE, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	8 50 32.83	+ 5.78	0.16	N. 19 13 21.0	- 24.6	2.3	4.4
2	8 52 51.62	5.78	0.16	19 3 26.6	24.9	2.3	4.4
3	8 55 10.40	5.78	0.16	18 53 25.3	25.2	2.3	4.4
4	8 57 29.17	5.78	0.16	18 43 17.1	25.5	2.3	4.4
5	8 59 47.92	5.78	0.15	18 33 2.0	25.8	2.2	4.3
6	9 2 6.66	5.78	0.15	18 22 40.2	26.1	2.2	4.3
7	9 4 25.39	5.78	0.15	18 12 11.6	26.3	2.2	4.3
8	9 6 44.09	5.78	0.15	18 1 36.4	26.6	2.2	4.3
9	9 9 2.76	5.78	0.15	17 50 54.5	26.9	2.2	4.3
10	9 11 21.40	5.78	0.15	17 40 6.0	27.2	2.2	4.3
11	9 13 40.02	5.77	0.15	17 29 11.0	27.4	2.2	4.3
12	9 15 58.60	5.77	0.15	17 18 9.5	27.7	2.2	4.2
13	9 18 17.15	5.77	0.15	17 7 1.6	27.9	2.2	4.2
14	9 20 35.65	5.77	0.15	16 55 47.4	28.2	2.2	4.2
15	9 22 54.10	5.77	0.15	16 44 26.9	28.5	2.2	4.2
16	9 25 12.51	5.77	0.15	16 33 0.1	28.7	2.2	4.2
17	9 27 30.86	5.76	0.15	16 21 27.2	29.0	2.2	4.2
18	9 29 49.16	5.76	0.15	16 9 48.1	29.3	2.2	4.2
19	9 32 7.40	5.76	0.14	15 58 3.0	29.5	2.1	4.1
20	9 34 25.58	5.76	0.14	15 46 11.9	29.8	2.1	4.1
21	9 36 43.71	5.75	0.14	15 34 14.9	30.0	2.1	4.1
22	9 39 1.77	5.75	0	15 22 12.1	30.2	2.1	4.1
23	9 41 19.78	5.75	0	15 10 3.5	30.5	2.1	4.1
24	9 43 37.72	5.75	0	14 57 49.1	30.7	2.1	4.1
25	9 45 55.61	5.74	0	14 45 29.1	31.0	2.1	4.1
26	9 48 13.45	5.74	0	14 33 3.4	31.2	2.1	4.0
27	9 50 31.23	5.74	0	14 20 32.2	31.4	2.1	4.0
28	9 52 48.96	5.74	0	55.5	31.6	2.1	4.0
29	9 55 6.65			3	31.9	2.1	4.0
30	9 57 24.29				32.1	2.1	4.0
31	9 59 41.89					2.1	4.0

JULY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<i>h m s</i>	<i>° ' "</i>		<i>h m</i>	<i>° ' "</i>	<i>° ' "</i>	
1	9 59 22.52	N. 13 31 21.9	0.3327548	3 22.4	174 25 54.4	N. 1 29 47.8	0.218
2	10 1 40.25	13 18 23.6	.3340242	3 20.8	174 52 28.6	1 29 17.3	.218
3	10 3 57.94	13 5 20.0	.3352794	3 19.1	175 19 3.7	1 28 46.5	.218
4	10 6 15.59	12 52 11.3	.3365205	3 17.5	175 45 39.7	1 28 15.3	.218
5	10 8 33.22	12 38 57.5	.3377475	3 15.8	176 12 16.6	1 27 43.8	.218
6	10 10 50.82	12 25 38.6	.3389604	3 14.2	176 38 54.5	1 27 12.0	.217
7	10 13 8.39	12 12 14.7	.3401592	3 12.5	177 5 33.5	1 26 39.8	.217
8	10 15 25.94	11 58 46.0	.3413440	3 10.9	177 32 13.4	1 26 7.3	.217
9	10 17 43.47	11 45 12.4	.3425148	3 9.2	177 58 54.3	1 25 34.5	.217
10	10 20 0.97	11 31 34.1	.3436716	3 7.6	178 25 36.3	1 25 1.3	.217
11	10 22 18.45	11 17 51.1	.3448143	3 5.9	178 52 19.3	1 24 27.8	.217
12	10 24 35.92	11 4 3.5	.3459431	3 4.3	179 19 3.4	1 23 54.0	.217
13	10 26 53.36	10 50 11.3	.3470581	3 2.6	179 45 48.6	1 23 19.8	.217
14	10 29 10.78	10 36 14.7	.3481593	3 1.0	180 12 34.9	1 22 45.3	.217
15	10 31 28.19	10 22 13.7	.3492469	2 59.3	180 39 22.4	1 22 10.5	.217
16	10 33 45.58	10 8 8.4	.3503208	2 57.7	181 6 11.0	1 21 35.4	.217
17	10 36 2.95	9 53 58.9	.3513811	2 56.0	181 33 0.8	1 20 59.9	.217
18	10 38 20.31	9 39 45.3	.3524281	2 54.4	181 59 51.8	1 20 24.1	.217
19	10 40 37.65	9 25 27.6	.3534619	2 52.7	182 26 44.0	1 19 48.0	.217
20	10 42 54.99	9 11 6.0	.3544826	2 51.1	182 53 37.4	1 19 11.6	.217
21	10 45 12.33	8 56 40.5	.3554902	2 49.4	183 20 32.1	1 18 34.9	.217
22	10 47 29.67	8 42 11.1	.3564850	2 47.8	183 47 28.0	1 17 57.8	.217
23	10 49 47.01	8 27 38.0	.3574671	2 46.1	184 14 25.2	1 17 20.4	.217
24	10 52 4.37	8 13 1.3	.3584366	2 44.5	184 41 23.8	1 16 42.7	.217
25	10 54 21.74	7 58 20.9	.3593936	2 42.8	185 8 23.7	1 16 4.7	.217
26	10 56 39.13	7 43 37.0	.3603382	2 41.2	185 35 24.9	1 15 26.4	.217
27	10 58 56.55	7 28 49.6	.3612704	2 39.5	186 2 27.5	1 14 47.7	.217
28	11 1 14.00	7 13 58.8	.3621903	2 37.9	186 29 31.5	1 14 8.8	.217
29	11 3 31.49	6 59 4.7	.3630981	2 36.2	186 56 36.8	1 13 29.5	.217
30	11 5 49.02	6 44 7.3	.3639937	2 34.6	187 23 43.6	1 12 49.9	.217
31	11 8 6.60	6 29 6.7	.3648771	2 32.9	187 50 51.9	1 12 10.1	.217
32	11 10 24.24	N. 6 14 3.0	0.3657484	2 31.3	188 18 1.6	N. 1 11 29.9	0.218



## JULY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup> 9 59 41·89	+ 5·73	0·14	N. 13 29 32·8	- 32·3	2·1	4·0
10 1 59·45	5·73	0·14	13 16 34·6	32·5	2·1	4·0
10 4 16·97	5·73	0·14	13 3 31·2	32·7	2·1	4·0
10 6 34·47	5·73	0·14	12 50 22·7	33·0	2·1	4·0
10 8 51·93	5·73	0·13	12 37 9·1	33·2	2·0	3·9
10 11 9·37	5·73	0·13	12 23 50·5	33·4	2·0	3·9
10 13 26·78	5·72	0·13	12 10 26·9	33·6	2·0	3·9
10 15 44·17	5·72	0·13	11 56 58·4	33·8	2·0	3·9
10 18 1·54	5·72	0·13	11 43 25·2	34·0	2·0	3·9
10 20 18·88	5·72	0·13	11 29 47·2	34·2	2·0	3·9
10 22 36·21	5·72	0·13	11 16 4·5	34·4	2·0	3·9
10 24 53·51	5·72	0·13	11 2 17·2	34·6	2·0	3·9
10 27 10·79	5·72	0·13	10 48 25·4	34·8	2·0	3·9
10 29 28·05	5·72	0·13	10 34 29·2	34·9	2·0	3·8
10 31 45·30	5·72	0·13	10 20 28·6	35·1	2·0	3·8
10 34 2·53	5·72	0·13	10 6 23·8	35·3	2·0	3·8
10 36 19·74	5·72	0·13	9 52 14·8	35·5	2·0	3·8
10 38 36·94	5·72	0·13	9 38 1·6	35·6	2·0	3·8
10 40 54·13	5·72	0·13	9 23 44·5	35·8	2·0	3·8
10 43 11·31	5·72	0·13	9 9 23·4	36·0	2·0	3·8
10 45 28·49	5·72	0·13	8 54 58·4	36·1	2·0	3·8
10 47 45·67	5·72	0·13	8 40 29·6	36·3	2·0	3·8
10 50 2·86	5·72	0·13	8 25 57·1	36·4	2·0	3·8
10 52 20·06	5·72	0·13	8 11 20·9	36·6	2·0	3·8
10 54 37·27	5·72	0·13	7 56 41·1	36·7	2·0	3·8
10 56 54·51	5·72	0·13	7 41 57·8	36·9	2·0	3·7
10 59 11·77	5·72	0·13	7 27 11·1	37·0	2·0	3·7
11 1 29·07	5·72	0·13	7 12 20·9	37·2	2·0	3·7
11 3 46·41	5·72	0·13	6 57 27·3	37·3	2·0	3·7
11 6 3·79	5·73	0·13	6 42 30·8	37·4	2·0	3·7
11 8 21·22	5·73	0·13	6 27 30·9	37·6	2·0	3·7
11 10 38·71	+ 5·73	0·13	N. 6 12 27·5	- 37·7	2·0	3·7

## AUGUST, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 10 24.24	N. 6 14 3.0	0.3657484	2 31.3	188 18 1.6	N. 1 11 29.9	0.213
2	11 12 41.94	5 58 56.3	.3666075	2 29.6	188 45 12.7	1 10 49.4	.213
3	11 14 59.71	5 43 46.6	.3674546	2 28.0	189 12 25.4	1 10 8.6	.213
4	11 17 17.55	5 28 34.0	.3682896	2 26.3	189 39 39.6	1 9 27.5	.213
5	11 19 35.47	5 13 18.6	.3691125	2 24.7	190 6 55.3	1 8 46.1	.212
6	11 21 53.47	4 58 0.5	.3699233	2 23.1	190 34 12.5	1 8 4.5	.212
7	11 24 11.56	4 42 39.8	.3707220	2 21.4	191 1 31.3	1 7 22.5	.212
8	11 26 29.74	4 27 16.5	.3715087	2 19.8	191 28 51.8	1 6 40.2	.212
9	11 28 48.01	4 11 50.7	.3722833	2 18.1	191 56 13.8	1 5 57.6	.211
10	11 31 6.38	3 56 22.6	.3730458	2 16.5	192 23 37.4	1 5 14.8	.211
11	11 33 24.85	3 40 52.2	.3737962	2 14.9	192 51 2.7	1 4 31.6	.211
12	11 35 43.42	3 25 19.6	.3745348	2 13.3	193 18 29.7	1 3 48.2	.211
13	11 38 2.10	3 9 44.9	.3752615	2 11.6	193 45 58.3	1 3 4.4	.210
14	11 40 20.90	2 54 8.3	.3759765	2 10.0	194 13 28.6	1 2 20.4	.210
15	11 42 39.81	2 38 29.7	.3766798	2 8.4	194 41 0.7	1 1 36.1	.210
16	11 44 58.84	2 22 49.3	.3773714	2 6.8	195 8 34.5	1 0 51.5	.210
17	11 47 17.99	2 7 7.2	.3780516	2 5.1	195 36 10.1	1 0 6.6	.210
18	11 49 37.28	1 51 23.5	.3787205	2 3.5	196 3 47.4	0 59 21.4	.209
19	11 51 56.70	1 35 38.3	.3793781	2 1.9	196 31 26.5	0 58 36.0	.209
20	11 54 16.27	1 19 51.6	.3800245	2 0.3	196 59 7.5	0 57 50.3	.209
21	11 56 35.99	1 4 3.5	.3806599	1 58.7	197 26 50.3	0 57 4.3	.209
22	11 58 55.86	0 48 14.2	.3812844	1 57.1	197 54 34.9	0 56 18.0	.208
23	12 1 15.90	0 32 23.7	.3818981	1 55.5	198 22 21.4	0 55 31.4	.208
24	12 3 36.11	0 16 32.1	.3825010	1 53.9	198 50 9.8	0 54 44.6	.208
25	12 5 56.50	N. 0 0 39.5	.3830932	1 52.3	199 18 0.0	0 53 57.5	.208
26	12 8 17.08	S. 0 15 14.0	.3836747	1 50.7	199 45 52.2	0 53 10.1	.207
27	12 10 37.85	0 31 8.4	.3842455	1 49.1	200 13 46.4	0 52 22.5	.207
28	12 12 58.83	0 47 3.6	.3848058	1 47.5	200 41 42.5	0 51 34.6	.207
29	12 15 20.02	1 2 59.4	.3853555	1 45.9	201 9 40.6	0 50 46.4	.207
30	12 17 41.43	1 18 55.8	.3858946	1 44.3	201 37 40.6	0 49 58.0	.206
31	12 20 3.06	1 34 52.7	.3864231	1 42.7	202 5 42.7	0 49 9.3	.206
32	12 22 24.93	S. 1 50 50.0	0.3869411	1 41.1	202 33 46.8	N. 0 48 20.4	0.206



## AUGUST, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
1	<sup>h</sup> 11 <sup>m</sup> 10 <sup>s</sup> 38.71	+ 5.73	0.13	N. 6° 12' 27".9	- 37".7	1".9	3".7
2	11 12 56.26	5.73	0.13	5 57 21.9	37".8	1".9	3".7
3	11 15 13.87	5.74	0.13	5 42 13.0	37".9	1".9	3".7
4	11 17 31.56	5.74	0.13	5 27 1.1	38".1	1".9	3".7
5	11 19 49.34	5.74	0.13	5 11 46.4	38".2	1".9	3".7
6	11 22 7.19	5.75	0.13	4 56 29.1	38".3	1".9	3".7
7	11 24 25.13	5.75	0.13	4 41 9.2	38".4	1".9	3".7
8	11 26 43.16	5.75	0.13	4 25 46.7	38".5	1".9	3".6
9	11 29 1.28	5.76	0.13	4 10 21.8	38".6	1".9	3".6
10	11 31 19.50	5.76	0.13	3 54 54.5	38".7	1".9	3".6
11	11 33 37.82	5.77	0.13	3 39 24.9	38".8	1".9	3".6
12	11 35 56.25	5.77	0.13	3 23 53.2	38".9	1".9	3".6
13	11 38 14.79	5.77	0.13	3 8 19.4	39".0	1".9	3".6
14	11 40 33.44	5.78	0.13	2 52 43.6	39".1	1".9	3".6
15	11 42 52.20	5.78	0.13	2 37 5.9	39".1	1".9	3".6
16	11 45 11.08	5.79	0.13	2 21 26.5	39".2	1".9	3".6
17	11 47 30.09	5.79	0.13	2 5 45.3	39".3	1".9	3".6
18	11 49 49.23	5.80	0.13	1 50 2.5	39".3	1".9	3".6
19	11 52 8.51	5.81	0.13	1 34 18.2	39".4	1".9	3".6
20	11 54 27.94	5.81	0.13	1 18 32.4	39".4	1".9	3".6
21	11 56 47.51	5.82	0.13	1 2 45.3	39".5	1".9	3".6
22	11 59 7.24	5.83	0.13	0 46 57.0	39".5	1".9	3".6
23	12 1 27.13	5.83	0.13	0 31 7.5	39".6	1".9	
24	12 3 47.20	5.84	0.13	N. 0 15 16.8	39".6	1".9	
25	12 6 7.45	5.85	0.13	S. 0 0 34.8	39".7		
26	12 8 27.89	5.86	0.12	0 16 27.3	39".7		
27	12 10 48.52	5.86	0.12	0 32 20.7	39".7		
28	12 13 9.36	5.87	0.12	0 48 14.9			
29	12 15 30.41	5.88	0.12	1 4 9.7			
30	12 17 51.68	5.89	0.12	1 20 5.1			
31	12 20 13.17	5.90	0.12	1 36 1.0			
32	12 22 34.90	+ 5.91	0.12	S. 1 51 57.3	-		

## SEPTEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	12 22 24.93	S. 1 50 50.0	0.3869411	1 41.1	202 33 46.8	N. 0 48 20.4	0.206
2	12 24 47.03	2 6 47.6	*3874484	1 39.6	203 1 53.0	0 47 31.2	*206
3	12 27 9.38	2 22 45.4	*3879451	1 38.0	203 30 1.3	0 46 41.8	*205
4	12 29 31.99	2 38 43.3	*3884312	1 36.4	203 58 11.7	0 45 52.1	*205
5	12 31 54.86	2 54 41.2	*3889066	1 34.9	204 26 24.1	0 45 2.2	*205
6	12 34 17.99	3 10 39.0	*3893715	1 33.3	204 54 38.7	0 44 12.0	*205
7	12 36 41.38	3 26 36.5	*3898258	1 31.8	205 22 55.5	0 43 21.6	*204
8	12 39 5.05	3 42 33.7	*3902696	1 30.2	205 51 14.4	0 42 30.9	*204
9	12 41 29.00	3 58 30.5	*3907028	1 28.7	206 19 35.5	0 41 40.0	*204
10	12 43 53.23	4 14 26.7	*3911254	1 27.1	206 47 58.9	0 40 48.9	*203
11	12 46 17.75	4 30 22.2	*3915377	1 25.6	207 16 24.4	0 39 57.5	*203
12	12 48 42.56	4 46 16.9	*3919397	1 24.1	207 44 52.2	0 39 5.9	*203
13	12 51 7.67	5 2 10.7	*3923314	1 22.6	208 13 22.3	0 38 14.1	*203
14	12 53 33.09	5 18 3.5	*3927129	1 21.1	208 41 54.7	0 37 22.0	*202
15	12 55 58.82	5 33 55.1	*3930843	1 19.5	209 10 29.3	0 36 29.8	*202
16	12 58 24.86	5 49 45.5	*3934457	1 18.0	209 39 6.3	0 35 37.3	*202
17	13 0 51.23	6 5 34.5	*3937972	1 16.5	210 7 45.6	0 34 44.5	*201
18	13 3 17.94	6 21 22.1	*3941389	1 15.0	210 36 27.3	0 33 51.6	*201
19	13 5 44.98	6 37 8.1	*3944710	1 13.5	211 5 11.3	0 32 58.5	*201
20	13 8 12.37	6 52 52.3	*3947934	1 12.0	211 33 57.7	0 32 5.1	*200
21	13 10 40.12	7 8 34.7	*3951064	1 10.6	212 2 46.5	0 31 11.5	*200
22	13 13 8.23	7 24 15.2	*3954100	1 9.1	212 31 37.7	0 30 17.7	*200
23	13 15 36.71	7 39 53.6	*3957042	1 7.6	213 0 31.4	0 29 23.7	*200
24	13 18 5.57	7 55 29.9	*3959890	1 6.2	213 29 27.5	0 28 29.5	*199
25	13 20 34.82	8 11 3.9	*3962645	1 4.7	213 58 26.1	0 27 35.1	*199
26	13 23 4.47	8 26 35.6	*3965307	1 3.3	214 27 27.2	0 26 40.5	*199
27	13 25 34.52	8 42 4.8	*3967877	1 1.8	214 56 30.8	0 25 45.7	*198
28	13 28 4.99	8 57 31.4	*3970353	1 0.4	215 25 36.9	0 24 50.8	*198
29	13 30 35.88	9 12 55.2	*3972736	0 59.0	215 54 45.6	0 23 55.6	*198
30	13 33 7.19	9 28 16.2	*3975026	0 57.6	216 23 56.8	0 23 0.2	*197
31	13 35 38.93	S. 9 43 34.2	0.3977222	0 56.2	216 53 10.6	N. 0 22 4.7	0.197



## SEPTEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	12 22 34.90	+ 5.91	0.12	S. 1 51 57.3	-39.9	1.8	3.5
2	12 24 56.87	5.92	0.12	2 7 53.8	39.9	1.8	3.5
3	12 27 19.08	5.93	0.12	2 23 50.6	39.9	1.8	3.5
4	12 29 41.55	5.94	0.12	2 39 47.5	39.9	1.8	3.5
5	12 32 4.28	5.95	0.12	2 55 44.3	39.9	1.8	3.5
6	12 34 27.27	5.96	0.12	3 11 41.0	39.9	1.8	3.5
7	12 36 50.53	5.97	0.12	3 27 37.5	39.8	1.8	3.5
8	12 39 14.06	5.99	0.12	3 43 33.7	39.8	1.8	3.5
9	12 41 37.87	6.00	0.12	3 59 29.4	39.8	1.8	3.5
10	12 44 1.96	6.01	0.12	4 15 24.5	39.8	1.8	3.5
11	12 46 26.34	6.02	0.12	4 31 18.9	39.8	1.8	3.5
12	12 48 51.02	6.03	0.12	4 47 12.6	39.7	1.8	3.5
13	12 51 16.00	6.05	0.12	5 3 5.4	39.7	1.8	3.5
14	12 53 41.28	6.06	0.12	5 18 57.1	39.6	1.8	3.5
15	12 56 6.87	6.07	0.12	5 34 47.7	39.6	1.8	3.5
16	12 58 32.78	6.09	0.12	5 50 37.0	39.5	1.8	3.5
17	13 0 59.02	6.10	0.12	6 6 24.9	39.4	1.8	3.5
18	13 3 25.59	6.11	0.12	6 22 11.4	39.4	1.8	3.5
19	13 5 52.50	6.13	0.12	6 37 56.3	39.3	1.8	3.5
20	13 8 19.75	6.14	0.12	6 53 39.5	39.3	1.8	3.5
21	13 10 47.36	6.16	0.12	7 9 20.8	39.2	1.8	3.5
22	13 13 15.34	6.17	0.12	7 25 0.3	39.1	1.8	3.5
23	13 15 43.69	6.19	0.12	7 40 37.7	39.0	1.8	3.4
24	13 18 12.42	6.21	0.12	7 56 12.9	38.9	1.8	3.4
25	13 20 41.54	6.22	0.12	8 11 45.9	38.8	1.8	3.4
26	13 23 11.06	6.24	0.12	8 27 16.5	38.7	1.8	3.4
27	13 25 40.98	6.26	0.12	8 42 44.6	38.6	1.8	
28	13 28 11.31	6.27	0.12	8 58 10.2	38.5	1	
29	13 30 42.07	6.29	0.12	9 13 33.0	38.4		
30	13 33 13.25	6.31	0.12	9 28 52.9	38.3		
31	13 35 44.86	+ 6.33	0.12	S. 9 44 9.9	-38.1		

## OCTOBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	13 35 38.93	S. 9 43 34.2	0.3977222	0 56.2	216 53 10.6	N. 0 22 4.7	0.197
2	13 38 11.12	9 58 49.1	.3979324	0 54.8	217 22 27.0	0 21 9.0	.197
3	13 40 43.76	10 14 0.8	.3981331	0 53.4	217 51 46.0	0 20 13.1	.196
4	13 43 16.85	10 29 9.1	.3983244	0 52.0	218 21 7.6	0 19 17.1	.196
5	13 45 50.89	10 44 13.9	.3985063	0 50.6	218 50 31.9	0 18 20.9	.196
6	13 48 24.40	10 59 15.1	.3986790	0 49.2	219 19 58.8	0 17 24.5	.195
7	13 50 58.87	11 14 12.5	.3988425	0 47.8	219 49 28.4	0 16 27.9	.195
8	13 53 33.81	11 29 5.9	.3989967	0 46.5	220 19 0.7	0 15 31.2	.195
9	13 56 9.22	11 43 55.2	.3991419	0 45.1	220 48 35.7	0 14 34.3	.194
10	13 58 45.11	11 58 40.3	.3992780	0 43.8	221 18 13.5	0 13 37.3	.194
11	14 1 21.49	12 13 21.0	.3994051	0 42.5	221 47 54.0	0 12 40.1	.194
12	14 3 58.36	12 27 57.2	.3995232	0 41.1	222 17 37.3	0 11 42.8	.193
13	14 6 35.72	12 42 28.8	.3996325	0 39.8	222 47 23.3	0 10 45.4	.193
14	14 9 13.58	12 56 55.5	.3997329	0 38.5	223 17 12.1	0 9 47.8	.193
15	14 11 51.94	13 11 17.3	.3998245	0 37.2	223 47 3.7	0 8 50.1	.192
16	14 14 30.81	13 25 34.0	.3999074	0 35.9	224 16 58.2	0 7 52.2	.192
17	14 17 10.20	13 39 45.4	.3999818	0 34.6	224 46 55.5	0 6 54.2	.192
18	14 19 50.11	13 53 51.5	.4000478	0 33.3	225 16 55.6	0 5 56.1	.191
19	14 22 30.55	14 7 52.0	.4001053	0 32.1	225 46 58.6	0 4 57.9	.191
20	14 25 11.52	14 21 46.8	.4001546	0 30.8	226 17 4.6	0 3 59.5	.191
21	14 27 53.03	14 35 35.8	.4001958	0 29.6	226 47 13.4	0 3 1.0	.190
22	14 30 35.09	14 49 18.8	.4002288	0 28.3	227 17 25.1	0 2 2.5	.190
23	14 33 17.71	15 2 55.7	.4002537	0 27.1	227 47 39.8	0 1 3.8	.190
24	14 36 0.89	15 16 26.3	.4002704	0 25.9	228 17 57.4	N. 0 0 5.0	.189
25	14 38 44.63	15 29 50.5	.4002791	0 24.7	228 48 18.0	S. 0 0 53.8	.189
26	14 41 28.94	15 43 8.2	.4002798	0 23.5	229 18 41.5	0 1 52.8	.189
27	14 44 13.83	15 56 19.2	.4002725	0 22.3	229 49 8.0	0 2 51.8	.188
28	14 46 59.30	16 9 23.3	.4002571	0 21.1	230 19 37.5	0 3 51.0	.188
29	14 49 45.35	16 22 20.4	.4002336	0 19.9	230 50 10.1	0 4 50.2	.188
30	14 52 31.99	16 35 10.3	.4002021	0 18.7	231 20 45.7	0 5 49.4	.188
31	14 55 19.22	16 47 52.9	.4001626	0 17.6	231 51 24.3	0 6 48.8	.188
32	14 58 7.05	S. 17 0 28.1	0.4001150	0 16.4	232 22 6.0	S. 0 7 48.2	0.188



## OCTOBER, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup>	<sup>°</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
13 35 44.86	+ 6.33	0.12	S. 9 44 9.9	-38.1	1.8	3.4
13 38 16.92	6.35	0.12	9 59 23.8	38.0	1.8	3.4
13 40 49.42	6.36	0.12	10 14 34.5	37.9	1.8	3.4
13 43 22.38	6.38	0.12	10 29 41.8	37.7	1.8	3.4
13 45 55.79	6.40	0.12	10 44 45.6	37.6	1.8	3.4
13 48 29.67	6.42	0.12	10 59 45.8	37.5	1.8	3.4
13 51 4.01	6.44	0.12	11 14 42.2	37.3	1.8	3.4
13 53 38.82	6.46	0.12	11 29 34.7	37.1	1.8	3.4
13 56 14.10	6.48	0.12	11 44 23.0	36.9	1.8	3.4
13 58 49.86	6.50	0.12	11 59 7.1	36.7	1.8	3.4
14 1 26.11	6.52	0.12	12 13 46.9	36.6	1.8	3.4
14 4 2.85	6.54	0.12	12 28 22.2	36.4	1.8	3.4
14 6 40.08	6.56	0.12	12 42 52.8	36.2	1.8	3.4
14 9 17.81	6.58	0.12	12 57 18.6	36.0	1.8	3.4
14 11 56.04	6.60	0.12	13 11 39.5	35.8	1.8	3.4
14 14 34.78	6.63	0.12	13 25 55.3	35.5	1.8	3.4
14 17 14.04	6.65	0.12	13 40 5.8	35.3	1.8	3.4
14 19 53.82	6.67	0.12	13 54 11.0	35.1	1.8	3.4
14 22 34.13	6.69	0.12	14 8 10.6	34.9	1.8	3.4
14 25 14.97	6.71	0.12	14 22 4.6	34.6	1.8	3.4
14 27 56.36	6.74	0.12	14 35 52.7	34.4	1.8	3.4
14 30 38.29	6.76	0.12	14 49 34.9	34.1	1.8	3.4
14 33 20.78	6.78	0.12	15 3 11.0	33.9	1.8	3.4
14 36 3.83	6.81	0.12	15 16 40.8	33.6	1.8	3.4
14 38 47.44	6.83	0.12	15 30 4.2	33.3	1.8	3.4
14 41 31.62	6.85	0.12	15 43 21.1	33.1	1.8	3.4
14 44 16.38	6.88	0.12	15 56 31.3	32.8	1.8	3.4
14 47 1.72	6.90	0.12	16 9 34.7	32.5	1.8	3.4
14 49 47.65	6.93	0.12	16 22 34.1	32.2	1.8	3.4
14 52 34.17	6.95	0.12	16 35 38.5	31.9	1.8	3.4
14 55 21.27	6.98	0.12	16 48 37.9	31.6	1.8	3.4
14 58 8.97	+ 7.00	0.12	S. 17 0 37.3	-31.3	1.8	3.4

## NOVEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No.
1	<sup>h</sup> 14 <sup>m</sup> 58 <sup>s</sup> 7.05	S. 17° 0' 28.1"	0.4001150	<sup>h</sup> 16 <sup>m</sup> 4	<sup>o</sup> 232 <sup>t</sup> 22 <sup>"</sup> 6.0	S. 0° 7' 48.2"	0.186
2	15 0 55.47	17 12 55.6	.4000593	0 15.3	232 52 50.8	0 8 47.7	.186
3	15 3 44.49	17 25 15.3	.3999956	0 14.2	233 23 38.7	0 9 47.2	.186
4	15 6 34.11	17 37 27.0	.3999238	0 13.1	233 54 29.6	0 10 46.8	.185
5	15 9 24.32	17 49 30.6	.3998441	0 12.0	234 25 23.7	0 11 46.4	.185
6	15 12 15.13	18 1 25.9	.3997564	0 10.9	234 56 20.9	0 12 46.1	.185
7	15 15 6.54	18 13 12.7	.3996609	0 9.8	235 27 21.3	0 13 45.8	.1846
8	15 17 58.54	18 24 50.8	.3995574	0 8.7	235 58 24.8	0 14 45.6	.1843
9	15 20 51.14	18 36 20.1	.3994462	0 7.6	236 29 31.5	0 15 45.4	.1839
10	15 23 44.34	18 47 40.4	.3993273	0 6.6	237 0 41.4	0 16 45.2	.1833
11	15 26 38.14	18 58 51.5	.3992008	0 5.6	237 31 54.4	0 17 45.0	.1832
12	15 29 32.53	19 9 53.3	.3990669	0 4.5	238 3 10.7	0 18 44.9	.1828
13	15 32 27.51	19 20 45.6	.3989256	0 3.5	238 34 30.2	0 19 44.7	.1824
14	15 35 23.09	19 31 28.2	.3987771	0 2.5	239 5 52.9	0 20 44.6	.1821
15	15 38 19.27	19 42 1.0	.3986214	0 1.5	239 37 18.8	0 21 44.5	.1817
16	15 41 16.04	19 52 23.8	.3984586	$\left\{ \begin{smallmatrix} 0 & 0.3 \\ 23 & 30.5 \end{smallmatrix} \right\}$	240 8 48.0	0 22 44.3	.1813
17	15 44 13.40	20 2 36.5	.3982889	23 58.5	240 40 20.4	0 23 44.2	.1809
18	15 47 11.35	20 12 38.9	.3981123	23 57.5	241 11 56.1	0 24 44.0	.1806
19	15 50 9.90	20 22 30.8	.3979288	23 56.6	241 43 35.0	0 25 43.8	.1802
20	15 53 9.05	20 32 12.1	.3977387	23 55.6	242 15 17.2	0 26 43.6	.1798
21	15 56 8.80	20 41 42.6	.3975418	23 54.7	242 47 2.7	0 27 43.3	.1793
22	15 59 9.14	20 51 2.2	.3973383	23 53.8	243 18 51.5	0 28 43.0	.1791
23	16 2 10.07	21 0 10.7	.3971281	23 52.8	243 50 43.6	0 29 42.6	.1787
24	16 5 11.59	21 9 8.0	.3969113	23 51.9	244 22 39.1	0 30 42.2	.1783
25	16 8 13.70	21 17 53.9	.3966878	23 51.0	244 54 37.9	0 31 41.8	.1779
26	16 11 16.39	21 26 28.2	.3964578	23 50.2	245 26 40.0	0 32 41.3	.1776
27	16 14 19.66	21 34 50.8	.3962211	23 49.3	245 58 45.4	0 33 40.7	.1772
28	16 17 23.51	21 43 1.6	.3959778	23 48.4	246 30 54.2	0 34 40.0	.1768
29	16 20 27.92	21 51 0.4	.3957279	23 47.6	247 3 6.3	0 35 39.3	.1764
30	16 23 32.89	21 58 47.0	.3954714	23 46.7	247 35 21.8	0 36 38.4	.1761
31	16 26 38.42	S. 22° 6' 21.3"	0.3952084	23 45.9	248 7 40.7	S. 0° 37' 37.5"	0.1757



## NOVEMBER, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
	14 58 8.97	+ 7.00	0.12	S. 17 0 36.7	- 31.3	1.8	3.4
	15 0 57.27	7.02	0.12	17 13 3.5	31.0	1.8	3.4
	15 3 46.16	7.05	0.12	17 25 22.5	30.6	1.8	3.4
	15 6 35.65	7.07	0.12	17 37 33.6	30.3	1.8	3.4
	15 9 25.74	7.10	0.12	17 49 36.6	30.0	1.8	3.4
	15 12 16.42	7.12	0.12	18 1 31.3	29.6	1.8	3.4
	15 15 7.71	7.15	0.12	18 13 17.5	29.2	1.8	3.4
	15 17 59.59	7.17	0.12	18 24 55.0	28.9	1.8	3.4
	15 20 52.06	7.20	0.12	18 36 23.7	28.5	1.8	3.4
	15 23 45.14	7.22	0.12	18 47 43.5	28.1	1.8	3.4
	15 26 38.81	7.25	0.12	18 58 54.1	27.7	1.8	3.4
	15 29 33.07	7.27	0.12	19 9 55.4	27.4	1.8	3.4
	15 32 27.93	7.30	0.12	19 20 47.2	27.0	1.8	3.4
	15 35 23.39	7.32	0.12	19 31 29.3	26.6	1.8	3.4
	15 38 19.45	7.35	0.12	19 42 1.6	26.1	1.8	3.4
	{ 15 41 16.00 } { 15 44 13.23 }	{ 7.37 } { 7.40 }	{ 0.12 } { 0.12 }	{ 19 52 24.0 } { 20 2 36.3 }	{ 25.7 } { 25.3 }	{ 1.8 } { 1.8 }	{ 3.4 } { 3.4 }
	15 47 11.17	7.42	0.13	20 12 38.3	24.9	1.8	3.4
	15 50 9.60	7.45	0.13	20 22 29.8	24.4	1.8	3.4
	15 53 8.63	7.47	0.13	20 32 10.7	24.0	1.8	3.4
	15 56 8.26	7.50	0.13	20 41 40.9	23.5	1.8	3.4
	15 59 8.48	7.52	0.13	20 51 0.2	23.1	1.8	3.4
	16 2 9.29	7.55	0.13	21 0 8.4	22.6	1.8	3.4
	16 5 10.69	7.57	0.13	21 9 5.4	22.1	1.8	
	16 8 12.68	7.60	0.13	21 17 51.0	21.7	1.8	
	16 11 15.25	7.62	0.13	21 26 25.1	21.2	1.8	
	16 14 18.41	7.64	0.13	21 34 47.4	20.7		
	16 17 22.14	7.67	0.13	21 42 58.0	20.2		
	16 20 26.43	7.69	0.13	21 50 56.6	19.7		
	16 23 31.29	7.71	0.13	21 58 43.0	19.2		
	16 26 36.71	7.74	0.13	22 6 17.2	18.7		
	16 29 42.67	+ 7.76	0.13	S. 22 13 38.9	- 18.1		

## DECEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	L. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	
1	<sup>h m s</sup> 16 26 38.42	<sup>° ' "</sup> S. 22 6 21.3	0.3952084	<sup>h m</sup> 23 45.9	<sup>° ' "</sup> 248 7 40.7	<sup>° ' "</sup> S. 0 37 37.5	0.11
2	16 29 44.50	22 13 43.2	.3949387	23 45.0	248 40 3.0	0 38 36.5	.11
3	16 32 51.11	22 20 52.4	.3946625	23 44.2	249 12 28.6	0 39 35.4	.11
4	16 35 58.25	22 27 48.9	.3943798	23 43.4	249 44 57.7	0 40 34.1	.11
5	16 39 5.92	22 34 32.4	.3940906	23 42.6	250 17 30.1	0 41 32.8	.11
6	16 42 14.10	22 41 2.9	.3937952	23 41.8	250 50 5.9	0 42 31.3	.11
7	16 45 22.78	22 47 20.2	.3934934	23 41.0	251 22 45.2	0 43 29.7	.11
8	16 48 31.95	22 53 24.1	.3931854	23 40.2	251 55 27.8	0 44 27.9	.11
9	16 51 41.60	22 59 14.6	.3928713	23 39.4	252 28 13.9	0 45 26.0	.11
10	16 54 51.73	23 4 51.4	.3925511	23 38.7	253 1 3.4	0 46 24.0	.11
11	16 58 2.32	23 10 14.5	.3922251	23 37.9	253 33 56.4	0 47 21.9	.11
12	17 1 13.37	23 15 23.7	.3918933	23 37.2	254 6 52.7	0 48 19.5	.11
13	17 4 24.85	23 20 18.9	.3915558	23 36.4	254 39 52.5	0 49 17.0	.11
14	17 7 36.76	23 25 0.0	.3912127	23 35.7	255 12 55.7	0 50 14.3	.11
15	17 10 49.10	23 29 26.9	.3908641	23 35.0	255 46 2.4	0 51 11.5	.11
16	17 14 1.85	23 33 39.4	.3905102	23 34.2	256 19 12.5	0 52 8.4	.11
17	17 17 15.00	23 37 37.5	.3901509	23 33.5	256 52 26.0	0 53 5.2	.11
18	17 20 28.54	23 41 21.0	.3897865	23 32.8	257 25 43.0	0 54 1.7	.11
19	17 23 42.47	23 44 49.9	.3894169	23 32.1	257 59 3.4	0 54 58.1	.11
20	17 26 56.77	23 48 4.1	.3890424	23 31.4	258 32 27.3	0 55 54.2	.11
21	17 30 11.44	23 51 3.4	.3886629	23 30.7	259 5 51.7	0 56 50.1	.11
22	17 33 26.45	23 53 47.7	.3882784	23 30.0	259 39 25.4	0 57 45.8	.11
23	17 36 41.80	23 56 17.0	.3878889	23 29.3	260 12 59.6	0 58 41.2	.11
24	17 39 57.48	23 58 31.3	.3874945	23 28.7	260 46 37.3	0 59 36.4	.11
25	17 43 13.47	24 0 30.4	.3870951	23 28.0	261 20 18.4	1 0 31.4	.11
26	17 46 29.77	24 2 14.2	.3866908	23 27.3	261 54 3.0	1 1 26.1	.11
27	17 49 46.35	24 3 42.7	.3862816	23 26.7	262 27 51.0	1 2 20.5	.11
28	17 53 3.21	24 4 55.7	.3858674	23 26.0	263 1 42.4	1 3 14.7	.11
29	17 56 20.32	24 5 53.3	.3854484	23 25.4	263 35 37.2	1 4 8.6	.11
30	17 59 37.67	24 6 35.4	.3850245	23 24.7	264 9 35.5	1 5 2.2	.11
31	18 2 55.24	24 7 1.9	.3845957	23 24.1	264 43 37.3	1 5 55.5	.11
32	18 6 13.02	S. 24 7 12.8	0.3841621	23 23.4	265 17 42.4	S. 1 6 48.5	0.11



## DECEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
1	<sup>h</sup> 16 <sup>m</sup> 29 <sup>s</sup> 42·67	+ 7·76	0·13	S. 22° 13' 38" 9	—18·1	1·8	3·5
2	16 32 49·17	7·78	0·13	22 20 48·0	17·6	1·8	3·5
3	16 35 56·20	7·80	0·13	22 27 44·3	17·1	1·8	3·5
4	16 39 3·75	7·83	0·13	22 34 27·8	16·6	1·8	3·5
5	16 42 11·82	7·85	0·13	22 40 58·3	16·0	1·8	3·5
6	16 45 20·39	7·87	0·13	22 47 15·5	15·5	1·8	3·5
7	16 48 29·45	7·89	0·13	22 53 19·4	14·9	1·8	3·5
8	16 51 39·00	7·91	0·13	22 59 9·9	14·3	1·8	3·5
9	16 54 49·02	7·93	0·13	23 4 46·7	13·7	1·8	3·5
10	16 57 59·50	7·95	0·13	23 10 9·8	13·2	1·8	3·5
11	17 1 10·43	7·96	0·13	23 15 19·0	12·6	1·8	3·5
12	17 4 21·81	7·98	0·13	23 20 14·3	12·0	1·8	3·5
13	17 7 33·62	8·00	0·13	23 24 55·5	11·4	1·8	3·5
14	17 10 45·85	8·02	0·13	23 29 22·5	10·8	1·8	3·5
15	17 13 58·49	8·04	0·13	23 33 35·1	10·2	1·8	3·5
16	17 17 11·54	8·05	0·13	23 37 33·3	9·6	1·8	3·5
17	17 20 24·98	8·07	0·13	23 41 17·0	9·0	1·8	3·5
18	17 23 38·81	8·08	0·13	23 44 46·1	8·4	1·8	3·5
19	17 26 53·01	8·10	0·13	23 48 0·4	7·8	1·8	3·5
20	17 30 7·57	8·11	0·13	23 50 59·9	7·2	1·8	3·5
21	17 33 22·48	8·13	0·13	23 53 41·5	6·5	1·8	3·5
22	17 36 37·73	8·14	0·13	23 56 14·1	9	1·8	3·5
23	17 39 53·31	8·16	0·13	23 58 28·6		1·8	3·5
24	17 43 9·20	8·17	0·13	24 0 28·0		1·8	3·5
25	17 46 25·40	8·18	0·13	24 2 12·1		1·8	3·5
26	17 49 41·89	8·19	0·13	24 3 40·3		1·8	3·5
27	17 52 58·65	8·20	0·13	24 5 8·4		1·8	3·5
28	17 56 15·66	8·21	0·13	24 7 16·5		1·8	3·5
29	17 59 32·92	8·22	0·13	24 9 44·6		1·8	3·5
30	18 2 50·40	8·23	0·13	24 12 12·7		1·8	3·5
31	18 6 8·09	8·24	0·13	24 14 40·8		1·8	3·5
32	18 9 25·97	+ 8·25	0·13	S. 24 17 8·9		1·8	3·5

## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
Jan. 1	7 36.4	N. 22 30	0.1909	12 50.6	107 46	N. 0 33	0.40
5	7 32.2	22 52	0.1878	12 30.7	108 43	0 40	0.40
9	7 27.8	23 13	0.1861	12 10.6	109 39	0 47	0.40
13	7 23.4	23 34	0.1857	11 50.5	110 36	0 54	0.40
17	7 19.0	23 54	0.1866	11 30.4	111 33	1 1	0.40
21	7 14.7	24 13	0.1888	11 10.5	112 30	1 8	0.39
25	7 10.7	24 30	0.1923	10 50.8	113 27	1 15	0.39
29	7 6.9	24 46	0.1969	10 31.3	114 25	1 22	0.39
Feb. 2	7 3.5	25 0	0.2026	10 12.2	115 22	1 29	0.39
6	7 0.5	25 13	0.2091	9 53.5	116 19	1 36	0.39
10	6 57.9	25 25	0.2165	9 35.3	117 17	1 44	0.39
14	6 55.9	25 35	0.2247	9 17.6	118 15	1 51	0.39
18	6 54.4	25 44	0.2335	9 0.4	119 13	1 58	0.39
22	6 53.4	25 51	0.2427	8 43.8	120 11	2 5	0.39
26	6 53.0	25 57	0.2523	8 27.8	121 9	2 12	0.39
March 2	6 53.1	26 2	0.2621	8 12.3	122 7	2 19	0.39
6	6 53.8	26 6	0.2721	7 57.2	123 6	2 25	0.39
10	6 54.9	26 9	0.2822	7 42.6	124 5	2 32	0.39
14	6 56.5	26 11	0.2923	7 28.5	125 4	2 39	0.39
18	6 58.6	26 11	0.3025	7 14.8	126 3	2 46	0.39
22	7 1.1	26 11	0.3126	7 1.6	127 2	2 53	0.39
26	7 4.0	26 10	0.3225	6 48.8	128 1	3 0	0.39
30	7 7.4	26 8	0.3323	6 36.5	129 1	3 6	0.39
April 3	7 11.1	26 5	0.3419	6 24.5	130 1	3 13	0.39
7	7 15.1	26 0	0.3513	6 12.8	131 1	3 20	0.39
11	7 19.4	25 54	0.3604	6 1.3	132 1	3 26	0.39
15	7 24.0	25 48	0.3693	5 50.2	133 1	3 33	0.39
19	7 28.9	25 40	0.3780	5 39.3	134 1	3 40	0.39
23	7 34.0	25 31	0.3864	5 28.7	135 2	3 46	0.39
27	7 39.4	25 21	0.3945	5 18.3	136 3	3 53	0.39
May 1	7 45.0	25 9	0.4023	5 8.1	137 4	3 59	0.39
5	7 50.7	N. 24 56	0.4099	4 58.2	138 6	N. 4 5	0.39



MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
May 5	7 50.7	N. 24 56	0.4099	4 58.2	138 6	N. 4 5	0.3847
9	7 56.6	24 42	0.4172	4 48.4	139 8	4 12	0.3841
13	8 2.7	24 27	0.4242	4 38.7	140 10	4 18	0.3834
17	8 8.9	24 11	0.4309	4 29.2	141 12	4 24	0.3827
21	8 15.2	23 53	0.4374	4 19.8	142 14	4 30	0.3820
25	8 21.7	23 34	0.4436	4 10.5	143 16	4 36	0.3813
29	8 28.3	23 13	0.4495	4 1.3	144 19	4 42	0.3806
June 2	8 35.0	22 51	0.4552	3 52.3	145 22	4 48	0.3799
6	8 41.8	22 28	0.4606	3 43.3	146 25	4 54	0.3792
10	8 48.6	22 4	0.4657	3 34.4	147 28	4 59	0.3785
14	8 55.5	21 38	0.4706	3 25.6	148 31	5 5	0.3778
18	9 2.5	21 11	0.4752	3 16.8	149 35	5 10	0.3771
22	9 9.5	20 43	0.4795	3 8.0	150 39	5 15	0.3764
26	9 16.6	20 14	0.4836	2 59.3	151 43	5 21	0.3757
30	9 23.7	19 43	0.4875	2 50.6	152 47	5 26	0.3750
July 4	9 30.8	19 11	0.4911	2 42.0	153 52	5 31	0.3742
8	9 38.0	18 38	0.4945	2 33.4	154 57	5 36	0.3735
12	9 45.2	18 4	0.4977	2 24.8	156 2	5 41	0.3728
16	9 52.4	17 28	0.5006	2 16.3	157 7	5 46	0.3720
20	9 59.6	16 52	0.5033	2 7.8	158 13	5 51	0.3713
24	10 6.9	16 15	0.5058	1 59.3	159 17	5 56	0.3706
28	10 14.2	15 37	0.5080	1 50.9	160 22	6 0	0.3698
Aug. 1	10 21.5	14 58	0.5100	1 42.4	161 27	6 6	0.3691
5	10 28.8	14 18	0.5118	1 33.9	162 32	6 11	0.3683
9	10 36.1	13 37	0.5134	1 25.5	163 37	6 16	0.3675
13	10 43.4	12 55	0.5148	1 17.0	164 42	6 21	0.3668
17	10 50.7	12 13	0.5159	1 8.5	165 47	6 26	0.3661
21	10 58.0	11 30	0.5168	1 0.1	166 52	6 31	0.3653
25	11 5.3	10 46	0.5175	0 51.7	167 57	6 36	0.3646
29	11 12.7	10 2	0.5180	0 43.3	168 52	6 41	0.3638
Sept. 2	11 20.1	9 18	0.5182	0 34.9	169 57	6 46	0.3630
6	11 27.4	N. 8 33	0.5182	0 26.5	170 52	6 51	0.3622

## EPHEMERIS OF VESTA FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hour Past
1849.	<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>t</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
November 10	7 55 8.09	+ 0.97	N.19 36 26.3	+ 1.7	4.5
11	7 55 30.48	0.90	19 37 11.0	2.0	4.3
12	7 55 51.26	0.83	19 38 1.6	2.2	4.3
13	7 56 10.41	0.76	19 38 58.1	2.5	4.3
14	7 56 27.91	0.69	19 40 0.8	2.7	4.4
15	7 56 43.75	0.62	19 41 9.6	3.0	4.4
16	7 56 57.91	0.55	19 42 24.7	3.3	4.4
17	7 57 10.37	0.48	19 43 46.2	3.5	4.4
18	7 57 21.12	0.41	19 45 14.2	3.8	4.5
19	7 57 30.14	0.34	19 46 48.8	4.1	4.5
20	7 57 37.42	0.27	19 48 30.0	4.4	4.5
21	7 57 42.95	0.19	19 50 17.9	4.6	4.6
22	7 57 46.70	0.12	19 52 12.6	4.9	4.6
23	7 57 48.67	+ 0.04	19 54 14.2	5.2	4.6
24	7 57 48.84	- 0.03	19 56 22.6	5.5	4.6
25	7 57 47.21	0.11	19 58 38.0	5.8	4.7
26	7 57 43.77	0.18	20 1 0.4	6.1	4.7
27	7 57 38.50	0.26	20 3 29.7	6.4	4.7
28	7 57 31.39	0.33	20 6 6.0	6.7	4.8
29	7 57 22.43	0.41	20 8 49.4	7.0	4.8
30	7 57 11.61	0.49	20 11 39.8	7.2	4.8
December 1	7 56 58.93	0.57	20 14 37.2	7.5	4.8
2	7 56 44.39	0.64	20 17 41.5	7.8	4.9
3	7 56 27.98	0.72	20 20 52.7	8.1	4.9
4	7 56 9.70	0.80	20 24 10.9	8.4	4.9
5	7 55 49.56	0.88	20 27 35.9	8.7	4.9
6	7 55 27.53	0.96	20 31 7.7	9.0	5.0
7	7 55 3.61	1.04	20 34 46.2	9.2	5.0
8	7 54 37.83	1.11	20 38 31.4	9.5	5.0
9	7 54 10.18	1.19	20 42 23.0	9.8	5.1
10	7 53 40.67	- 1.27	N.20 46 21.0	+ 10.1	5.1



EPHEMERIS OF VESTA FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1849.					
December 10	<sup>h</sup> 7 <sup>m</sup> 53 <sup>s</sup> 40·67	— 1·27	N. 20° 46' 21·0	+ 10·1	5·1
11	7 53 9·33	1·34	20 50 25·3	10·3	5·1
12	7 52 36·15	1·42	20 54 35·7	10·6	5·1
13	7 52 1·16	1·49	20 58 52·0	10·8	5·2
14	7 51 24·39	1·57	21 3 14·0	11·0	5·2
15	7 50 45·86	1·64	21 7 41·5	11·3	5·2
16	7 50 5·61	1·71	21 12 14·4	11·5	5·2
17	7 49 23·65	1·78	21 16 52·4	11·7	5·3
18	7 48 40·04	1·85	21 21 35·2	11·9	5·3
19	7 47 54·81	1·92	21 26 22·6	12·1	5·3
20	7 47 8·01	1·98	21 31 14·4	12·2	5·3
21	7 46 19·66	2·05	21 36 10·2	12·4	5·3
22	7 45 29·83	2·11	21 41 9·9	12·6	5·4
23	7 44 38·54	2·17	21 46 13·1	12·7	5·4
24	7 43 45·86	2·23	21 51 19·6	12·8	5·4
25	7 42 51·84	2·28	21 56 29·0	12·9	5·4
26	7 41 56·52	2·33	22 1 41·1	13·0	5·4
27	7 40 59·98	2·38	22 6 55·5	13·1	5·5
28	7 40 2·26	2·43	22 12 11·9	13·2	5·5
29	7 39 3·42	2·47	22 17 30·0	13·3	5·5
30	7 38 3·54	2·52	22 22 49·5	13·3	5·5
31	7 37 2·67	2·56	22 28 10·0	13·4	5·5
1850.					
January 1	7 36 0·89	2·59	22 33 31·1	13·4	
2	7 34 58·27	2·63	22 38 52·6	13	
3	7 33 54·87	2·66	22 44 14·1		
4	7 32 50·77	2·68	22 49 35·3		
5	7 31 46·05	2·71	22 54 55·		
6	7 30 40·78	2·73	23 0		
7	7 29 35·05	2·75	23 5		
8	7 28 28·94	2·76	23 10		
8	9	— 2·77	N. 23 16		

## EPHEMERIS OF VESTA FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>s</sup>
January 9	7 27 22.55	— 2.77	N.23 16 5.0	+ 13.1	5.6
10	7 26 15.95	2.78	23 21 17.5	13.0	5.6
11	7 25 9.24	2.78	23 26 27.4	12.9	5.6
12	7 24 2.51	2.78	23 31 34.5	12.7	5.6
13	7 22 55.86	2.77	23 36 38.5	12.6	5.6
14	7 21 49.36	2.77	23 41 39.2	12.5	5.6
15	7 20 43.11	2.75	23 46 36.2	12.3	5.6
16	7 19 37.21	2.74	23 51 29.4	12.1	5.6
17	7 18 31.73	2.72	23 56 18.5	12.0	5.6
18	7 17 26.78	2.69	24 1 3.3	11.8	5.6
19	7 16 22.44	2.67	24 5 43.6	11.6	5.6
20	7 15 18.78	2.64	24 10 19.2	11.4	5.6
21	7 14 15.88	2.60	24 14 50.1	11.2	5.6
22	7 13 13.82	2.57	24 19 16.1	11.0	5.5
23	7 12 12.69	2.53	24 23 37.0	10.8	5.5
24	7 11 12.55	2.48	24 27 52.8	10.5	5.5
25	7 10 13.48	2.44	24 32 3.3	10.3	5.5
26	7 9 15.54	2.39	24 36 8.4	10.1	5.5
27	7 8 18.79	2.34	24 40 8.1	9.9	5.5
28	7 7 23.31	2.28	24 44 2.3	9.6	5.5
29	7 6 29.15	2.23	24 47 50.9	9.4	5.5
30	7 5 36.37	2.17	24 51 34.0	9.2	5.4
31	7 4 45.02	2.11	24 55 11.4	8.9	5.4
February 1	7 3 55.17	2.05	24 58 43.2	8.7	5.4
2	7 3 6.85	1.98	25 2 9.3	8.5	5.4
3	7 2 20.14	1.91	25 5 29.8	8.2	5.4
4	7 1 35.06	1.84	25 8 44.6	8.0	5.3
5	7 0 51.67	1.77	25 11 53.8	7.8	5.3
6	7 0 10.00	1.70	25 14 57.4	7.5	5.3
7	6 59 30.11	1.62	25 17 55.4	7.3	5.3
8	6 58 52.02	— 1.55	N.25 20 47.8	+ 7.1	5.2



EPHEMERIS OF VESTA FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.					
February 8	<sup>h</sup> 6 <sup>m</sup> 58 <sup>s</sup> 52.02	<sup>s</sup> 1.55	N. 25° 20' 47".8	+ <sup>"</sup> 7.1	<sup>"</sup> 5.2
9	6 58 15.78	1.47	25 23 34.7	6.8	5.2
10	6 57 41.41	1.39	25 26 16.2	6.6	5.2
11	6 57 8.95	1.31	25 28 52.3	6.4	5.2
12	6 56 38.42	1.23	25 31 23.1	6.2	5.2
13	6 56 9.84	1.15	25 33 48.6	6.0	5.1
14	6 55 43.24	1.07	25 36 8.9	5.7	5.1
15	6 55 18.62	0.98	25 38 24.1	5.5	5.1
16	6 54 56.01	0.90	25 40 34.2	5.3	5.1
17	6 54 35.41	0.82	25 42 39.4	5.1	5.0
18	6 54 16.83	0.73	25 44 39.7	4.9	5.0
19	6 54 0.27	0.65	25 46 35.2	4.7	5.0
20	6 53 45.73	0.56	25 48 26.0	4.5	5.0
21	6 53 33.22	0.48	25 50 12.0	4.3	4.9
22	6 53 22.73	0.40	25 51 53.5	4.1	4.9
23	6 53 14.25	0.31	25 53 30.4	3.9	4.9
24	6 53 7.77	0.23	25 55 2.9	3.8	4.9
25	6 53 3.29	0.15	25 56 31.0	3.6	4.8
26	6 53 0.81	— 0.06	25 57 54.6	3.4	4.8
27	6 53 0.31	+ 0.02	25 59 14.0	3.2	4.8
28	6 53 1.77	0.10	26 0 29.1	3.0	4.7
March 1	6 53 5.18	0.18	26 1 39.9	2.9	4.7
2	6 53 10.53	0.26	26 2 46.6	2.7	4.7
3	6 53 17.82	0.34	26 3 49.2	2.5	4.7
4	6 53 27.02	0.42	26 4 4.0	2.4	4.6
5	6 53 38.12	0.50	26 5 5.0	2.2	4.6
6	6 53 51.12	0.58	26 6 1.0	2.0	4.6
7	6 54 5.99	0.66		1.8	
8	6 54 22.72	0.74			
9	6 54 41.28	0.81			
10	6 55 1.67	+ 0.89	N		

## EPHEMERIS OF VESTA FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Ha. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>s</sup>
March 10	6 55 1'67	+ 0'89	N.26 9 14'7	+ 1'4	4'3
11	6 55 23'87	0'96	26 9 45'5	1'2	4'3
12	6 55 47'85	1'04	26 10 12'5	1'0	4'4
13	6 56 13'60	1'11	26 10 35'6	0'9	4'4
14	6 56 41'10	1'18	26 10 55'0	0'7	4'4
15	6 57 10'31	1'25	26 11 10'5	0'6	4'4
16	6 57 41'23	1'32	26 11 22'2	0'4	4'3
17	6 58 13'82	1'39	26 11 30'1	0'3	4'3
18	6 58 48'07	1'46	26 11 34'3	+ 0'1	4'3
19	6 59 23'95	1'53	26 11 34'7	— 0'1	4'3
20	7 0 1'43	1'59	26 11 31'3	0'2	4'2
21	7 0 40'49	1'66	26 11 24'1	0'4	4'2
22	7 1 21'10	1'72	26 11 13'1	0'5	4'2
23	7 2 3'23	1'79	26 10 58'4	0'7	4'2
24	7 2 46'86	1'85	26 10 39'9	0'9	4'1
25	7 3 31'96	1'91	26 10 17'6	1'0	4'1
26	7 4 18'50	1'97	26 9 51'5	1'2	4'1
27	7 5 6'46	2'03	26 9 21'5	1'3	4'1
28	7 5 55'82	2'09	26 8 47'7	1'5	4'0
29	7 6 46'56	2'14	26 8 10'1	1'7	4'0
30	7 7 38'64	2'20	26 7 28'5	1'8	4'0
31	7 8 32'05	2'25	26 6 43'0	2'0	4'0
April 1	7 9 26'76	2'31	26 5 53'6	2'1	3'9
2	7 10 22'76	2'36	26 5 0'2	2'3	3'9
3	7 11 20'02	2'41	26 4 2'8	2'5	3'9
4	7 12 18'53	2'46	26 3 1'4	2'6	3'9
5	7 13 18'26	2'51	26 1 56'0	2'8	3'9
6	7 14 19'20	2'56	26 0 46'5	3'0	3'8
7	7 15 21'33	2'61	25 59 32'9	3'2	3'8
8	7 16 24'63	2'66	25 58 15'1	3'3	3'8
9	7 17 29'06	+ 2'71	N.25 56 53'2	— 3'5	3'8



## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1850.	h m	° ' "		h m	° ' "	° ' "	
Jan. 1	13 23 '6	S. 5 57	0 '4753	18 38 '1	182 30	N. 2 41	0 '4722
5	13 27 '0	6 3	0 '4681	18 25 '7	183 12	2 50	0 '4734
9	13 30 '1	6 8	0 '4607	18 13 '0	183 53	2 59	0 '4747
13	13 33 '0	6 11	0 '4531	18 0 '1	184 34	3 8	0 '4759
17	13 35 '6	6 11	0 '4453	17 46 '9	185 15	3 17	0 '4771
21	13 38 '0	6 9	0 '4374	17 33 '5	185 56	3 26	0 '4783
25	13 40 '1	6 5	0 '4294	17 19 '8	186 36	3 35	0 '4795
29	13 41 '8	5 58	0 '4214	17 5 '7	187 16	3 44	0 '4807
Feb. 2	13 43 '3	5 49	0 '4133	16 51 '4	187 56	3 53	0 '4819
6	13 44 '4	5 38	0 '4053	16 36 '7	188 36	4 2	0 '4830
10	13 45 '2	5 25	0 '3974	16 21 '7	189 15	4 10	0 '4841
14	13 45 '6	5 9	0 '3896	16 6 '3	189 55	4 19	0 '4852
18	13 45 '7	4 51	0 '3820	15 50 '6	190 34	4 28	0 '4863
22	13 45 '4	4 31	0 '3746	15 34 '6	191 13	4 36	0 '4873
26	13 44 '7	4 8	0 '3676	15 18 '2	191 52	4 45	0 '4884
March 2	13 43 '7	3 43	0 '3611	15 1 '4	192 30	4 53	0 '4894
6	13 42 '4	3 16	0 '3550	14 44 '3	193 8	5 1	0 '4904
10	13 40 '7	2 47	0 '3495	14 26 '8	193 47	5 9	0 '4914
14	13 38 '7	2 17	0 '3447	14 9 '0	194 25	5 17	0 '4924
18	13 36 '4	1 46	0 '3406	13 51 '0	195 3	5 25	0 '4934
22	13 33 '9	1 14	0 '3374	13 32 '7	195 41	5 33	0 '4944
26	13 31 '1	0 42	0 '3350	13 14 '2	196 19	5 41	0 '4953
30	13 28 '2	S. 0 9	0 '3335	12 55 '6	196 56	5 48	0 '4962
April 3	13 25 '2	N. 0 23	0 '3330	12 36 '8	197 34	5 56	0 '4971
7	13 22 '1	0 55	0 '3334	12 18 '0	198 11	6 4	0 '4981
11	13 18 '9	1 26	0 '3347	11 59 '1	198 48	6 11	0 '4991
15	13 15 '7	1 55	0 '3370	11 40 '2	199 25	6 19	0 '5001
19	13 12 '6	2 22	0 '3402	11 21 '4	200 2		
23	13 9 '7	2 48	0 '3443	11 2 '8	200 38		
27	13 6 '9	3 11	0 '3492	10 44 '4	201 15		
May 1	13 4 '3	3 31	0 '3549	10 26 '2	201 52		
5	13 2 '0	N. 3 49	0 '3612	10 8 '1	202 2		

## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
May 5	13 2.0	N. 3 49	0.3612	10 8.1	202 28	N. 6 55	0.50
9	12 59.9	4 4	0.3681	9 50.3	203 4	7 2	0.50
13	12 58.1	4 16	0.3755	9 32.8	203 40	7 9	0.50
17	12 56.6	4 25	0.3834	9 15.6	204 16	7 16	0.50
21	12 55.4	4 31	0.3917	8 58.8	204 52	7 23	0.50
25	12 54.5	4 35	0.4002	8 42.3	205 28	7 30	0.50
29	12 54.0	4 36	0.4090	8 26.0	206 4	7 36	0.50
June 2	12 53.7	4 35	0.4179	8 10.0	206 40	7 43	0.50
6	12 53.7	4 32	0.4269	7 54.3	207 15	7 50	0.50
10	12 54.1	4 26	0.4360	7 39.0	207 50	7 56	0.51
14	12 54.8	4 18	0.4451	7 23.9	208 25	8 3	0.51
18	12 55.7	4 8	0.4542	7 9.1	209 0	8 9	0.51
22	12 56.9	3 56	0.4632	6 54.6	209 35	8 15	0.51
26	12 58.3	3 43	0.4721	6 40.3	210 10	8 21	0.51
30	13 0.0	3 28	0.4809	6 26.2	210 45	8 27	0.51
July 4	13 1.9	3 12	0.4896	6 12.4	211 19	8 33	0.51
8	13 4.0	2 55	0.4981	5 58.8	211 54	8 39	0.51
12	13 6.3	2 37	0.5064	5 45.4	212 29	8 45	0.51
16	13 8.9	2 17	0.5145	5 32.2	213 3	8 51	0.51
20	13 11.6	1 56	0.5224	5 19.2	213 38	8 57	0.51
24	13 14.5	1 34	0.5301	5 6.4	214 12	9 3	0.51
28	13 17.6	1 12	0.5375	4 53.7	214 46	9 8	0.51
Aug. 1	13 20.9	0 49	0.5446	4 41.2	215 21	9 14	0.51
5	13 24.3	0 26	0.5515	4 28.9	215 56	9 19	0.51
9	13 27.8	N. 0 2	0.5581	4 16.7	216 30	9 24	0.51
13	13 31.5	S. 0 23	0.5645	4 4.6	217 4	9 30	0.51
17	13 35.3	0 48	0.5706	3 52.7	217 38	9 35	0.51
21	13 39.2	1 13	0.5764	3 40.9	218 12	9 40	0.51
25	13 43.3	1 38	0.5820	3 29.2	218 47	9 46	0.52
29	13 47.5	2 4	0.5873	3 17.6	219 21	9 51	0.52
Sept. 2	13 51.7	2 30	0.5923	3 6.2	219 55	9 56	0.52
6	13 56.0	S. 2 56	0.5971	2 54.8	220 29	N. 10 1	0.52



## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1850.	h m	° ' "		h m	° ' "	° ' "	
Sept. 6	13 56.0	S. 2 56	0.5971	2 54.8	220 29	N. 10 1	0.5214
10	14 0.4	3 22	0.6016	2 43.5	221 3	10 6	0.5217
14	14 5.0	3 47	0.6058	2 32.3	221 37	10 11	0.5220
18	14 9.6	4 12	0.6097	2 21.2	222 11	10 16	0.5223
22	14 14.3	4 37	0.6134	2 10.2	222 45	10 21	0.5226
26	14 19.1	5 2	0.6168	1 59.2	223 19	10 25	0.5228
30	14 23.9	5 27	0.6199	1 48.3	223 53	10 30	0.5231
Oct. 4	14 28.8	5 51	0.6227	1 37.4	224 27	10 34	0.5233
8	14 33.8	6 15	0.6253	1 26.6	225 0	10 38	0.5235
12	14 38.8	6 38	0.6276	1 15.8	225 34	10 43	0.5237
16	14 43.9	7 1	0.6296	1 5.1	226 8	10 47	0.5239
20	14 49.0	7 24	0.6313	0 54.5	226 41	10 51	0.5241
24	14 54.2	7 46	0.6327	0 43.9	227 15	10 56	0.5243
28	14 59.4	8 7	0.6339	0 33.4	227 49	11 0	0.5245
Nov. 1	15 4.6	8 28	0.6348	0 22.9	228 23	11 4	0.5246
5	15 9.9	8 48	0.6354	0 12.4	228 57	11 8	0.5247
9	15 15.2	9 7	0.6357	0 2.0	229 31	11 12	0.5248
13	15 20.6	9 25	0.6358	23 49.0	230 4	11 16	0.5249
17	15 25.9	9 42	0.6356	23 38.7	230 38	11 20	0.5250
21	15 31.3	9 59	0.6351	23 28.3	231 12	11 24	0.5251
25	15 36.7	10 15	0.6343	23 17.9	231 45	11 27	0.5251
29	15 42.1	10 30	0.6332	23 7.5	232 19	11 31	0.5252
Dec. 3	15 47.5	10 44	0.6318	22 57.1	232 53	11 35	0.5252
7	15 52.8	10 56	0.6302	22 46.7	233 27	11 38	0.5252
11	15 58.2	11 7	0.6282	22 36.3	234 1	11 42	0.5252
15	16 3.5	11 17	0.6260	22 25.9	234 17	11 45	0.5252
19	16 8.8	11 27	0.6235	22 15.4	235 1	11 48	0.5252
23	16 14.1	11 35	0.6207	22 4.9	235 35	11 51	0.5252
27	16 19.3	11 42	0.6176	21 54.4	236 9	11 54	0.5251
31	16 24.5	11 48	0.6143	21 43.8	236 43	11 57	0.5250
35	16 29.6	S. 11 53	0.6106	21 33.3	237 17	12 0	0.5249

## EPHEMERIS OF JUNO FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.		Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	H Pa
1850.		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
January	8	13 29 51.42	+ 1.89	S. 6 6 55.4	— 2.3	3
	9	13 30 36.23	1.85	6 7 46.0	2.0	3
	10	13 31 20.12	1.81	6 8 28.9	1.6	3
	11	13 32 3.07	1.77	6 9 4.1	1.3	3
	12	13 32 45.06	1.73	6 9 31.5	1.0	3
	13	13 33 26.08	1.69	6 9 51.1	0.7	3
	14	13 34 6.11	1.65	6 10 2.7	— 0.3	3
	15	13 34 45.15	1.61	6 10 6.4	+ 0.1	3
	16	13 35 23.18	1.56	6 10 2.0	0.4	3
	17	13 36 0.18	1.52	6 9 49.5	0.7	3
	18	13 36 36.15	1.47	6 9 28.8	1.0	3
	19	13 37 11.07	1.43	6 8 59.9	1.4	3
	20	13 37 44.94	1.39	6 8 22.8	1.7	3
	21	13 38 17.73	1.34	6 7 37.3	2.1	3
	22	13 38 49.43	1.30	6 6 43.4	2.4	3
	23	13 39 20.04	1.25	6 5 41.1	2.8	3
	24	13 39 49.54	1.21	6 4 30.3	3.1	3
	25	13 40 17.92	1.16	6 3 11.0	3.5	3
	26	13 40 45.17	1.11	6 1 43.2	3.8	3
	27	13 41 11.27	1.06	6 0 6.7	4.2	3
	28	13 41 36.21	1.01	5 58 21.6	4.6	3
	29	13 41 59.98	0.97	5 56 27.7	4.9	3
	30	13 42 22.57	0.92	5 54 25.1	5.3	3
	31	13 42 43.96	0.87	5 52 13.7	5.7	3
February	1	13 43 4.14	0.82	5 49 53.5	6.0	3
	2	13 43 23.10	0.76	5 47 24.5	6.4	3
	3	13 43 40.82	0.71	5 44 46.5	6.8	3
	4	13 43 57.29	0.66	5 41 59.6	7.1	3
	5	13 44 12.50	0.61	5 39 3.7	7.5	3
	6	13 44 26.43	0.55	5 35 58.9	7.9	3
	7	13 44 39.07	+ 0.50	S. 5 32 45.1	+ 8.3	3



## EPHEMERIS OF JUNO FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.		Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
February	7	13 44 39.07	+ 0.50	S. 5 32 45.1	+ 8.3	3.4
	8	13 44 50.42	0.45	5 29 22.3	8.6	3.4
	9	13 45 0.48	0.39	5 25 50.4	9.0	3.4
	10	13 45 9.22	0.34	5 22 9.6	9.4	3.4
	11	13 45 16.64	0.28	5 18 19.8	9.8	3.4
	12	13 45 22.74	0.23	5 14 20.9	10.1	3.4
	13	13 45 27.51	0.17	5 10 13.2	10.5	3.5
	14	13 45 30.94	0.11	5 5 56.6	10.9	3.5
	15	13 45 33.03	+ 0.06	5 1 31.0	11.2	3.5
	16	13 45 33.78	0.00	4 56 56.7	11.6	3.5
	17	13 45 33.18	- 0.05	4 52 13.6	12.0	3.5
	18	13 45 31.24	0.11	4 47 21.9	12.3	3.6
	19	13 45 27.96	0.16	4 42 21.5	12.7	3.6
	20	13 45 23.34	0.22	4 37 12.6	13.0	3.6
	21	13 45 17.37	0.28	4 31 55.2	13.4	3.6
	22	13 45 10.07	0.33	4 26 29.5	13.7	3.6
	23	13 45 1.44	0.39	4 20 55.6	14.1	3.6
	24	13 44 51.48	0.44	4 15 13.5	14.4	3.7
	25	13 44 40.19	0.50	4 9 23.4	14.8	3.7
	26	13 44 27.58	0.55	4 3 25.3	15.1	3.7
	27	13 44 13.65	0.61	3 57 19.4	15.4	3.7
	28	13 43 58.40	0.66	3 51 5.9	15.7	3.7
March	1	13 43 41.85	0.72	3 44 44.8	16.0	3.7
	2	13 43 24.00	0.77	3 38 16.4	16.3	3.7
	3	13 43 4.86	0.82	3	16.6	3.7
	4	13 42 44.44	0.88		16.9	3.8
	5	13 42 22.76	0.92		17.2	3.8
	6	13 41 59.82	0		5	3.8
	7	13 41 35.64	1			3.8
	8	13 41 10.24	1			3.8
	9	13 40 43.63	- 1			3.8

## EPHEMERIS OF JUNO FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	H. Pa.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
March 9	13 40 43.63	- 1.13	S. 2 49 46.1	+ 18.2	3.7
10	13 40 15.85	1.18	2 42 25.6	18.5	3.7
11	13 39 46.91	1.23	2 34 59.5	18.7	3.7
12	13 39 16.84	1.28	2 27 28.3	18.9	3.7
13	13 38 45.66	1.32	2 19 52.1	19.1	3.7
14	13 38 13.40	1.37	2 12 11.3	19.3	3.7
15	13 37 40.09	1.41	2 4 26.2	19.5	3.7
16	13 37 5.76	1.45	1 56 37.1	19.6	3.7
17	13 36 30.45	1.49	1 48 44.3	19.8	3.7
18	13 35 54.18	1.53	1 40 48.2	19.9	3.7
19	13 35 17.00	1.57	1 32 49.1	20.0	3.7
20	13 34 38.93	1.60	1 24 47.3	20.1	3.7
21	13 34 0.01	1.64	1 16 43.2	20.2	3.7
22	13 33 20.28	1.67	1 8 37.1	20.3	3.7
23	13 32 39.78	1.70	1 0 29.4	20.3	4.0
24	13 31 58.55	1.73	0 52 20.4	20.4	4.0
25	13 31 16.63	1.76	0 44 10.6	20.4	4.0
26	13 30 34.05	1.79	0 36 0.2	20.4	4.0
27	13 29 50.85	1.81	0 27 49.7	20.4	4.0
28	13 29 7.08	1.83	0 19 39.4	20.4	4.0
29	13 28 22.78	1.86	0 11 29.7	20.4	4.0
30	13 27 37.98	1.88	S. 0 3 20.9	20.3	4.0
31	13 26 52.73	1.89	N. 0 4 46.5	20.3	4.0
April 1	13 26 7.07	1.91	0 12 52.2	20.2	4.0
2	13 25 21.06	1.92	0 20 55.9	20.1	4.0
3	13 24 34.73	1.94	0 28 57.1	20.0	4.0
4	13 23 48.13	1.95	0 36 55.5	19.9	4.0
5	13 23 1.30	1.95	0 44 50.7	19.7	4.0
6	13 22 14.30	1.96	0 52 42.3	19.6	4.0
7	13 21 27.16	1.97	1 0 30.0	19.4	4.0
8	13 20 39.95	- 1.97	N. 1 8 13.4	+ 19.2	4.0



## EPHEMERIS OF JUNO FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
April 8	13 20 39.95	— 1.97	N. 1 8 13.4	+ 19.2	4.0
9	13 19 52.71	1.97	1 15 52.1	19.0	4.0
10	13 19 5.49	1.97	1 23 25.8	18.8	4.0
11	13 18 18.33	1.96	1 30 54.0	18.6	4.0
12	13 17 31.29	1.96	1 38 16.4	18.3	4.0
13	13 16 44.42	1.95	1 45 32.8	18.1	4.0
14	13 15 57.76	1.94	1 52 42.8	17.8	4.0
15	13 15 11.35	1.93	1 59 46.0	17.5	3.9
16	13 14 25.25	1.91	2 6 42.2	17.2	3.9
17	13 13 39.51	1.90	2 13 31.1	16.9	3.9
18	13 12 54.17	1.88	2 20 12.3	16.6	3.9
19	13 12 9.26	1.86	2 26 45.7	16.2	3.9
20	13 11 24.82	1.84	2 33 11.0	15.9	3.9
21	13 10 40.91	1.82	2 39 28.0	15.5	3.9
22	13 9 57.55	1.79	2 45 36.4	15.2	3.9
23	13 9 14.78	1.77	2 51 36.0	14.8	3.9
24	13 8 32.64	1.74	2 57 26.7	14.4	3.9
25	13 7 51.16	1.71	3 3 8.3	14.0	3.9
26	13 7 10.38	1.68	3 8 40.6	13.7	3.8
27	13 6 30.32	1.65	3 14 3.5	13.3	3.8
28	13 5 51.02	1.62	3 19 16.8	12.9	3.8
29	13 5 12.51	1.59	3 24 20.4	12.4	3.8
30	13 4 34.81	1.55	3 29 14.2	12.0	3.8
May 1	13 3 57.95	1.52	3 33 58.1	11.6	3.8
2	13 3 21.97	1.48	3 38		3.8
3	13 2 46.88	1.44	3		3.8
4	13 2 12.72	1.40	3		3.7
5	13 1 39.51	1.36			
6	13 1 7.27	1.32			
7	13 0 36.02	1.28			
8	13 0 5.79	— 1.24	N		

## EPHEMERIS OF JUNO FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.		Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	H.
1850.		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	N. <sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>s</sup>
May	8	13 0 5.79	- 1.24	N. 4 2 19.5	+ 8.6	3'
	9	12 59 36.60	1.19	4 5 41.0	8.2	3'
	10	12 59 8.46	1.15	4 8 52.0	7.7	3'
	11	12 58 41.39	1.11	4 11 52.5	7.3	3'
	12	12 58 15.41	1.06	4 14 42.5	6.9	3'
	13	12 57 50.54	1.01	4 17 22.0	6.4	3'
	14	12 57 26.78	0.97	4 19 51.0	6.0	3'
	15	12 57 4.15	0.92	4 22 9.6	5.6	3'
	16	12 56 42.65	0.87	4 24 17.8	5.1	3'
	17	12 56 22.30	0.82	4 26 15.6	4.7	3'
	18	12 56 3.11	0.78	4 28 3.2	4.3	3'
	19	12 55 45.07	0.73	4 29 40.6	3.8	3'
	20	12 55 28.20	0.68	4 31 7.8	3.4	3'
	21	12 55 12.48	0.63	4 32 25.0	3.0	3'
	22	12 54 57.93	0.58	4 33 32.3	2.6	3'
	23	12 54 44.55	0.53	4 34 29.7	2.2	3'
	24	12 54 32.33	0.48	4 35 17.4	1.8	3'
	25	12 54 21.28	0.44	4 35 55.5	1.4	3'
	26	12 54 11.38	0.39	4 36 24.0	1.0	3'
	27	12 54 2.65	0.34	4 36 43.0	0.6	3'
	28	12 53 55.08	0.29	4 36 52.8	+ 0.2	3'
	29	12 53 48.66	0.24	4 36 53.3	- 0.2	3'
	30	12 53 43.39	0.20	4 36 44.7	0.5	3'
	31	12 53 39.27	0.15	4 36 27.2	0.9	3'
June	1	12 53 36.30	0.10	4 36 0.7	1.3	3'
	2	12 53 34.47	0.05	4 35 25.5	1.6	3'
	3	12 53 33.78	- 0.01	4 34 41.6	2.0	3'
	4	12 53 34.22	+ 0.04	4 33 49.1	2.4	3'
	5	12 53 35.80	0.09	4 32 48.2	2.7	3'
	6	12 53 38.50	0.14	4 31 39.0	3.1	3'
	7	12 53 42.32	+ 0.18	N. 4 30 21.5	- 3.4	3'



## EPHEMERIS OF JUNO FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Hor. Par.</i>
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
ne 7	12 53 42.32	+ 0.18	N. 4 30 21.5	— 3.4	3.2
8	12 53 47.26	0.23	4 28 56.0	3.7	3.2
9	12 53 53.29	0.27	4 27 22.5	4.1	3.2
10	12 54 0.43	0.32	4 25 41.2	4.4	3.1
11	12 54 8.66	0.37	4 23 52.2	4.7	3.1
12	12 54 17.96	0.41	4 21 55.6	5.0	3.1
13	12 54 28.33	0.45	4 19 51.5	5.3	3.1
14	12 54 39.77	0.50	4 17 40.2	5.6	3.1
15	12 54 52.25	0.54	4 15 21.7	5.9	3.1
16	12 55 5.77	0.58	4 12 56.1	6.2	3.0
17	12 55 20.32	0.63	4 10 23.6	6.5	3.0
18	12 55 35.88	0.67	4 7 44.4	6.8	3.0
19	12 55 52.44	0.71	4 4 58.6	7.0	3.0
20	12 56 10.00	0.75	4 2 6.2	7.3	3.0
21	12 56 28.54	0.79	3 59 7.5	7.6	3.0
22	12 56 48.04	0.83	3 56 2.5	7.8	3.0
23	12 57 8.50	0.87	3 52 51.4	8.1	2.9
24	12 57 29.90	0.91	3 49 34.3	8.3	2.9
25	12 57 52.23	0.95	3 46 11.3	8.6	2.9
26	12 58 15.48	0.99	3 42 42.6	8.8	2.9
27	12 58 39.64	1.03	3 39 8.2	9.0	2.9
28	12 59 4.70	1.06	3 35 28.3	9.3	2.9
29	12 59 30.65	1.10	3 31 43.0	9.5	2.9
30	12 59 57.48	1.14	3 27 52.4	9.7	2.9
ly 1	13 0 25.17	1.17	3 23 56.6		
2	13 0 53.72	1.21	3 19 55.7		
3	13 1 23.13	1.24	3 15 49.9		
4	13 1 53.38	1.28	3 11 39.1		
5	13 2 24.46	1.31	3 7 23.5		
6	13 2 56.36	1.35	3 3 3.2		
7	13 3 29.07	+ 1.38	N. 2 58 38.4		

## MEAN TIME.

Date.	Geocentric.				Heliocentric.	
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.
	Noon.	Noon.	Noon.		Noon.	Noon.
1850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>
Jun. 1	19 28 '8	N. 1 25	0 '6314	0 45 '7	298 37	N. 29 13
5	19 34 '2	1 26	0 '6328	0 35 '3	299 12	29 3
9	19 39 '6	1 29	0 '6340	0 24 '9	299 47	28 52
13	19 45 '0	1 33	0 '6349	0 14 '5	300 22	28 41
17	19 50 '3	1 38	0 '6356	0 4 '1	300 56	28 29
21	19 55 '6	1 45	0 '6360	23 51 '0	301 31	28 18
25	20 0 '9	1 53	0 '6362	23 40 '6	302 6	28 6
29	20 6 '2	2 2	0 '6361	23 30 '1	302 40	27 54
Feb. 2	20 11 '4	2 13	0 '6357	23 19 '6	303 14	27 42
6	20 16 '6	2 25	0 '6351	23 9 '0	303 48	27 30
10	20 21 '8	2 38	0 '6342	22 58 '4	304 21	27 18
14	20 26 '9	2 52	0 '6330	22 47 '8	304 55	27 6
18	20 32 '0	3 7	0 '6316	22 37 '1	305 29	26 54
22	20 37 '0	3 23	0 '6299	22 26 '4	306 2	26 41
26	20 41 '9	3 40	0 '6280	22 15 '6	306 35	26 28
March 2	20 46 '7	3 58	0 '6258	22 4 '7	307 8	26 15
6	20 51 '5	4 17	0 '6233	21 53 '6	307 41	26 2
10	20 56 '2	4 36	0 '6206	21 42 '5	308 14	25 49
14	21 0 '8	4 56	0 '6176	21 31 '3	308 47	25 36
18	21 5 '3	5 17	0 '6143	21 20 '0	309 20	25 23
22	21 9 '7	5 38	0 '6107	21 8 '7	309 53	25 10
26	21 14 '0	6 0	0 '6069	20 57 '3	310 25	24 56
30	21 18 '3	6 22	0 '6029	20 45 '7	310 57	24 42
April 3	21 22 '4	6 44	0 '5986	20 34 '0	311 30	24 28
7	21 26 '4	7 7	0 '5940	20 22 '2	312 2	24 14
11	21 30 '2	7 30	0 '5891	20 10 '3	312 34	24 0
15	21 33 '9	7 53	0 '5840	19 58 '2	313 6	23 46
19	21 37 '5	8 16	0 '5787	19 46 '0	313 38	23 32
23	21 40 '9	8 39	0 '5731	19 33 '7	314 9	23 18
27	21 44 '2	9 2	0 '5672	19 21 '2	314 41	23 4
May 1	21 47 '3	9 24	0 '5611	19 8 '5	315 13	22 49
5	21 50 '2	N. 9 46	0 '5548	18 55 '6	315 44	N. 22 34



## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
ay 5	21 50.2	N. 9 46	0.5548	18 55.6	315 44	N. 22 34	0.5346
9	21 52.9	10 8	0.5482	18 42.5	316 16	22 19	0.5344
13	21 55.4	10 29	0.5414	18 29.3	316 47	22 4	0.5342
17	21 57.8	10 50	0.5345	18 15.9	317 18	21 49	0.5340
21	22 0.0	11 10	0.5273	18 2.3	317 50	21 34	0.5338
25	22 1.9	11 29	0.5200	17 48.5	318 21	21 19	0.5335
29	22 3.6	11 46	0.5125	17 34.4	318 52	21 3	0.5332
ne 2	22 5.1	12 2	0.5049	17 20.0	319 23	20 48	0.5329
6	22 6.3	12 17	0.4971	17 5.4	319 54	20 32	0.5326
10	22 7.2	12 31	0.4891	16 50.6	320 24	20 16	0.5323
14	22 7.8	12 43	0.4811	16 35.5	320 55	20 0	0.5320
18	22 8.2	12 53	0.4731	16 20.1	321 26	19 44	0.5317
22	22 8.3	13 1	0.4650	16 4.4	321 56	19 28	0.5313
26	22 8.1	13 7	0.4570	15 48.5	322 27	19 12	0.5310
30	22 7.6	13 10	0.4490	15 32.3	322 58	18 56	0.5306
y 4	22 6.9	13 10	0.4411	15 15.7	323 28	18 39	0.5302
8	22 5.8	13 7	0.4334	14 58.9	323 59	18 23	0.5298
12	22 4.5	13 1	0.4260	14 41.8	324 30	18 6	0.5294
16	22 2.9	12 53	0.4188	14 24.4	325 0	17 49	0.5290
20	22 1.0	12 41	0.4120	14 6.7	325 31	17 32	0.5286
24	21 58.8	12 25	0.4056	13 48.8	326 1	17 15	0.5282
28	21 56.4	12 5	0.3997	13 30.6	326 31	16 58	0.5277
g. 1	21 53.8	11 41	0.3943	13 12.2	327 1	16 41	0.5272
5	21 51.0	11 14	0.3896	12 53.7	327 31	16 24	0.5267
9	21 48.1	10 43	0.3855	12 35.1	328 1	16 7	0.5262
13	21 45.1	10 9	0.3822	12 16.4	328 31	15 50	0.5257
17	21 42.0	9 32	0.3797	11 57.7	329 0	15 33	0.5252
21	21 39.0	8 51	0.3779	11 38.9			0.5247
25	21 36.0	8 8	0.3770	11 20.1			0.5242
29	21 33.1	7 23	0.3769	11 1.5			0.5237
pt. 2	21 30.2	6 35	0.3776	10 43.0			0.5232
6	21 27.5	N. 5 46	0.3793	10 24.7			0.5227

## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	
	Noon.	Noon.	Noon.		Noon.	Noon.	
1850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
Sept. 6	21 27.5	N. 5 46	0.3793	10 24.7	331 32	N. 14 1	0
10	21 25.0	4 57	0.3818	10 6.6	332 2	13 43	0
14	21 22.8	4 7	0.3850	9 48.6	332 33	13 24	0
18	21 20.8	3 17	0.3890	9 30.9	333 3	13 6	0
22	21 19.1	2 27	0.3936	9 13.5	333 33	12 47	0
26	21 17.7	1 38	0.3988	8 56.4	334 3	12 28	0
30	21 16.6	0 51	0.4046	8 39.6	334 33	12 9	0
Oct. 4	21 15.9	N. 0 5	0.4109	8 23.2	335 3	11 50	0
8	21 15.5	S. 0 39	0.4176	8 7.1	335 34	11 31	0
12	21 15.4	1 21	0.4246	7 51.3	336 4	11 12	0
16	21 15.7	2 1	0.4319	7 35.9	336 34	10 53	0
20	21 16.3	2 39	0.4395	7 20.8	337 5	10 33	0
24	21 17.2	3 14	0.4472	7 6.0	337 35	10 14	0
28	21 18.4	3 47	0.4550	6 51.5	338 5	9 54	0
Nov. 1	21 20.0	4 17	0.4628	6 37.4	338 36	9 34	0
5	21 21.8	4 44	0.4706	6 23.5	339 6	9 14	0
9	21 23.9	5 9	0.4784	6 9.9	339 37	8 54	0
13	21 26.3	5 32	0.4861	5 56.5	340 8	8 34	0
17	21 28.9	5 52	0.4937	5 43.4	340 38	8 14	0
21	21 31.8	6 10	0.5011	5 30.5	341 9	7 54	0
25	21 34.9	6 26	0.5084	5 17.9	341 40	7 33	0
29	21 38.2	6 39	0.5155	5 5.4	342 11	7 13	0
Dec. 3	21 41.7	6 50	0.5224	4 53.1	342 42	6 52	0
7	21 45.3	6 59	0.5291	4 41.1	343 13	6 31	0
11	21 49.1	7 6	0.5355	4 29.2	343 44	6 10	0
15	21 53.1	7 11	0.5417	4 17.5	344 15	5 49	0
19	21 57.3	7 14	0.5476	4 5.9	344 47	5 28	0
23	22 1.6	7 15	0.5532	3 54.5	345 18	5 7	0
27	22 6.0	7 15	0.5586	3 43.2	345 49	4 45	0
31	22 10.6	7 13	0.5637	3 32.0	346 21	4 23	0
35	22 15.3	S. 7 9	0.5685	3 21.0	346 53	N. 4 2	0



## EPHEMERIS OF PALLAS FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
ay 24	22 1 44.70	+ 1.14	N. 11 27 1.3	+ 11.5	2.6
25	22 2 11.61	1.10	11 31 34.4	11.3	2.6
26	22 2 37.65	1.07	11 36 3.4	11.1	2.6
27	22 3 2.83	1.03	11 40 28.2	10.9	2.6
28	22 3 27.12	0.99	11 44 48.6	10.8	2.6
29	22 3 50.53	0.96	11 49 4.6	10.6	2.6
30	22 4 13.04	0.92	11 53 16.0	10.4	2.6
31	22 4 34.64	0.88	11 57 22.7	10.2	2.7
me 1	22 4 55.32	0.84	12 1 24.4	10.0	2.7
2	22 5 15.07	0.80	12 5 21.1	9.8	2.7
3	22 5 33.87	0.76	12 9 12.6	9.6	2.7
4	22 5 51.72	0.72	12 12 58.7	9.3	2.7
5	22 6 8.60	0.68	12 16 39.3	9.1	2.7
6	22 6 24.51	0.64	12 20 14.1	8.8	2.7
7	22 6 39.44	0.60	12 23 43.1	8.6	2.7
8	22 6 53.37	0.56	12 27 6.0	8.3	2.8
9	22 7 6.31	0.52	12 30 22.7	8.1	2.8
10	22 7 18.23	0.48	12 33 33.0	7.8	2.8
11	22 7 29.14	0.43	12 36 36.6	7.5	2.8
12	22 7 39.02	0.39	12 39 33.5	7.2	2.8
13	22 7 47.87	0.35	12 42 23.4	6.9	2.8
14	22 7 55.69	0.30	12 45 6.3	6.6	2.8
15	22 8 2.47	0.26	12 47 41.8	6.3	2.8
16	22 8 8.20	0.22	12 50 9.8	6.0	2.8
17	22 8 12.88	0.17	12 52 30.2		
18	22 8 16.50	0.13	12 54 42.7		
19	22 8 19.06	0.08	12 56 47.3		
20	22 8 20.56	+ 0.04	12 58 43.7		
21	22 8 20.98	0.00	13 0 31.8		
22	22 8 20.33	- 0.05	13 2 11.3		
23	22 8 18.60	- 0.09	N. 13 3 42.2		

## EPHEMERIS OF PALLAS FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
June 23	22 8 18.60	— 0.09	N.13 3 42.2	+ 3.6
24	22 8 15.78	0.14	13 5 4.2	3.2
25	22 8 11.88	0.19	13 6 17.1	2.8
26	22 8 6.88	0.23	13 7 20.7	2.5
27	22 8 0.79	0.28	13 8 14.9	2.1
28	22 7 53.59	0.32	13 8 59.5	1.7
29	22 7 45.29	0.37	13 9 34.2	1.2
30	22 7 35.88	0.42	13 9 58.9	0.8
July 1	22 7 25.37	0.46	13 10 13.4	+ 0.4
2	22 7 13.74	0.51	13 10 17.4	— 0.1
3	22 7 1.01	0.55	13 10 10.8	0.5
4	22 6 47.17	0.60	13 9 53.4	1.0
5	22 6 32.22	0.65	13 9 24.9	1.4
6	22 6 16.17	0.69	13 8 45.3	1.9
7	22 5 59.02	0.74	13 7 54.2	2.4
8	22 5 40.77	0.78	13 6 51.5	2.9
9	22 5 21.44	0.83	13 5 37.0	3.4
10	22 5 1.04	0.87	13 4 10.5	3.9
11	22 4 39.57	0.92	13 2 31.8	4.4
12	22 4 17.03	0.96	13 0 40.9	4.9
13	22 3 53.45	1.00	12 58 37.5	5.4
14	22 3 28.85	1.05	12 56 21.6	5.9
15	22 3 3.22	1.09	12 53 52.9	6.5
16	22 2 36.58	1.13	12 51 11.3	7.0
17	22 2 8.96	1.17	12 48 16.8	7.5
18	22 1 40.36	1.21	12 45 9.2	8.1
19	22 1 10.80	1.25	12 41 48.4	8.7
20	22 0 40.30	1.29	12 38 14.3	9.2
21	22 0 8.88	1.33	12 34 26.9	9.8
22	21 59 36.55	1.37	12 30 26.0	10.3
23	21 59 3.33	— 1.40	N.12 26 11.6	— 10.9



## EPHEMERIS OF PALLAS FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
23	21 59 3.33	— 1.40	N. 12 26 11.6	— 10.9	3.4
24	21 58 29.25	1.44	12 21 43.6	11.5	3.4
25	21 57 54.33	1.47	12 17 1.9	12.0	3.4
26	21 57 18.58	1.51	12 12 6.4	12.6	3.4
27	21 56 42.03	1.54	12 6 57.2	13.2	3.4
28	21 56 4.70	1.57	12 1 34.1	13.8	3.4
29	21 55 26.62	1.60	11 55 57.2	14.3	3.4
30	21 54 47.81	1.63	11 50 6.4	14.9	3.4
31	21 54 8.31	1.66	11 44 1.8	15.5	3.4
1st	21 53 28.14	1.69	11 37 43.3	16.1	3.5
2	21 52 47.33	1.71	11 31 11.0	16.6	3.5
3	21 52 5.92	1.74	11 24 24.9	17.2	3.5
4	21 51 23.93	1.76	11 17 25.1	17.8	3.5
5	21 50 41.40	1.78	11 10 11.7	18.3	3.5
6	21 49 58.37	1.80	11 2 44.7	18.9	3.5
7	21 49 14.88	1.82	10 55 4.3	19.5	3.5
8	21 48 30.97	1.84	10 47 10.6	20.0	3.5
9	21 47 46.67	1.85	10 39 3.7	20.6	3.5
10	21 47 2.03	1.87	10 30 43.8	21.1	3.5
11	21 46 17.09	1.88	10 22 11.2	21.6	3.5
12	21 45 31.88	1.89	10 13 25.9	22.1	3.6
13	21 44 46.46	1.90	10 4 28.3	22.7	3.6
14	21 44 0.85	1.90	9 55 18.6	23.2	3.6
15	21 43 15.10	1.91	9 45 57.0	23.6	3.6
16	21 42 29.26	1.91	9 36 23.8	24.1	3.6
17	21 41 43.36	1.91	9 26 39.4	24.6	3.6
18	21 40 57.44	1.91	9 16 43.9	25.1	3.6
19	21 40 11.55	1.91	9 6 37.7	25.6	3.6
20	21 39 25.72	1.91	8 56 21.1	26.1	3.6
21	21 38 40.00	1.90	8 45 54.4	26.6	3.6
22	21 37 54.42	— 1.90	N. 8 35 15.8	27.1	3.6

## EPHEMERIS OF PALLAS FOR THE OPPOSITION

At Transit over the Meridian of Greenwich.

Date,	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
August 22	21 37 54.42	— 1.90	N. 8 35 18.0	— 26.7
23	21 37 9.03	1.89	8 24 32.2	27.1
24	21 36 23.86	1.88	8 13 37.3	27.5
25	21 35 38.96	1.86	8 2 33.8	27.8
26	21 34 54.36	1.85	7 51 22.0	28.2
27	21 34 10.10	1.84	7 40 2.2	28.5
28	21 33 26.22	1.82	7 28 34.9	28.8
29	21 32 42.77	1.80	7 17 0.4	29.1
30	21 31 59.78	1.78	7 5 19.2	29.3
31	21 31 17.30	1.76	6 53 31.7	29.6
September 1	21 30 35.35	1.74	6 41 38.2	29.8
2	21 29 53.99	1.71	6 29 39.3	30.1
3	21 29 13.24	1.68	6 17 35.3	30.3
4	21 28 33.15	1.66	6 5 26.7	30.4
5	21 27 53.76	1.63	5 53 13.9	30.6
6	21 27 15.09	1.60	5 40 57.5	30.8
7	21 26 37.18	1.56	5 28 37.8	30.9
8	21 26 0.08	1.53	5 16 15.3	31.0
9	21 25 23.82	1.49	5 3 50.6	31.1
10	21 24 48.42	1.46	4 51 24.0	31.1
11	21 24 13.91	1.42	4 38 56.0	31.2
12	21 23 40.32	1.38	4 26 27.0	31.2
13	21 23 7.68	1.34	4 13 57.5	31.2
14	21 22 36.01	1.30	4 1 27.9	31.2
15	21 22 5.34	1.26	3 48 58.7	31.2
16	21 21 35.69	1.21	3 36 30.2	31.2
17	21 21 7.08	1.17	3 24 2.8	31.1
18	21 20 39.52	1.13	3 11 36.9	31.0
19	21 20 13.04	1.08	2 59 13.0	30.9
20	21 19 47.66	1.03	2 46 51.3	30.8
21	21 19 23.38	— 0.99	N. 2 34 32.3	— 30.7



## EPHEMERIS OF PALLAS FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
850.					
ember 21	<sup>h</sup> 21 <sup>m</sup> 19 <sup>s</sup> 23·38	— 0·99	N. 2 34 32·3	— 30·7	3·5
22	21 19 0·23	0·94	2 22 16·3	30·6	3·5
23	21 18 38·21	0·89	2 10 3·6	30·5	3·5
24	21 18 17·35	0·84	1 57 54·6	30·3	3·4
25	21 17 57·66	0·80	1 45 49·7	30·1	3·4
26	21 17 39·14	0·75	1 33 49·1	29·9	3·4
27	21 17 21·81	0·70	1 21 53·1	29·7	3·4
28	21 17 5·68	0·65	1 10 2·1	29·5	3·4
29	21 16 50·77	0·60	0 58 16·3	29·3	3·4
ber 30	21 16 37·07	0·55	0 46 36·1	29·1	3·4
1	21 16 24·60	0·49	0 35 1·7	28·8	3·4
2	21 16 13·37	0·44	0 23 33·3	28·6	3·4
3	21 16 3·38	0·39	0 12 11·2	28·3	3·3
4	21 15 54·65	0·34	N. 0 0 55·7	28·0	3·3
5	21 15 47·17	0·29	S. 0 10 13·1	27·7	3·3
6	21 15 40·94	0·23	0 21 14·8	27·4	3·3
7	21 15 35·97	0·18	0 32 9·3	27·1	3·3
8	21 15 32·27	0·13	0 42 56·3	26·8	3·3
9	21 15 29·84	0·08	0 53 35·7	26·5	3·3
10	21 15 28·66	— 0·02	1 4 7·3	26·2	3·3
11	21 15 28·74	+ 0·03	1 14 30·9	25·8	3·2
12	21 15 30·08	0·08	1 24 46·4	25·5	3·2
13	21 15 32·66	0·13	1 34 53·6	25·1	3·2
14	21 15 36·49	0·19	1 44 52·4	24·8	3·2
15	21 15 41·55	0·24	1 54 42·7	24·4	3·2
16	21 15 47·84	0·29	2 4 24·3	24·1	3·2
17	21 15 55·35	0·34	2 13 57·2	23·7	3
18	21 16 4·08	0·39	2 23 21·2	23·3	
19	21 16 14·01	0·44	2 32 36·3	23·0	
20	21 16 25·15	0·49	2 41 42·5	22·6	
21	21 16 37·47	+ 0·54	S. 2 50 39·6	— 22·2	

## EPHEMERIS OF PALLAS FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.		Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.
1850.		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
October	21	21 16 37.47	+ 0.54	S. 2 50 39.6	— 22.2
	22	21 16 50.98	0.59	2 59 27.6	21.8
	23	21 17 5.66	0.64	3 8 6.4	21.4
	24	21 17 21.51	0.68	3 16 36.1	21.0
	25	21 17 38.52	0.73	3 24 56.5	20.7
	26	21 17 56.67	0.78	3 33 7.6	20.3
	27	21 18 15.97	0.83	3 41 9.4	19.9
	28	21 18 36.40	0.87	3 49 1.9	19.5
	29	21 18 57.95	0.92	3 56 45.0	19.1
	30	21 19 20.61	0.97	4 4 18.7	18.7
	31	21 19 44.38	1.01	4 11 43.0	18.3
November	1	21 20 9.24	1.06	4 18 57.9	17.9
	2	21 20 35.19	1.10	4 26 3.3	17.5
	3	21 21 2.21	1.15	4 32 59.3	17.1
	4	21 21 30.29	1.19	4 39 45.9	16.7
	5	21 21 59.43	1.24	4 46 23.1	16.4
	6	21 22 29.61	1.28	4 52 50.9	16.0
	7	21 23 0.81	1.32	4 59 9.3	15.6
	8	21 23 33.03	1.36	5 5 18.3	15.2
	9	21 24 6.26	1.41	5 11 18.1	14.8
	10	21 24 40.47	1.45	5 17 8.5	14.4
	11	21 25 15.65	1.49	5 22 49.7	14.0
	12	21 25 51.79	1.53	5 28 21.7	13.6
	13	21 26 28.88	1.56	5 33 44.5	13.3
	14	21 27 6.90	1.60	5 38 58.2	12.9
	15	21 27 45.83	1.64	5 44 2.8	12.5
	16	21 28 25.67	1.68	5 48 58.5	12.1
	17	21 29 6.40	1.72	5 53 45.2	11.8
	18	21 29 48.01	1.75	5 58 23.0	11.4
	19	21 30 30.48	1.79	6 2 52.0	11.0
	20	21 31 13.80	+ 1.82	S. 6 7 12.3	— 10.7



## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
a. 1	20 32.6	S. 25 27	0.5844	1 49.3	311 47	S. 8 17	0.4729
5	20 39.2	25 5	0.5869	1 40.2	312 31	8 22	0.4731
9	20 45.8	24 43	0.5892	1 31.0	313 15	8 27	0.4732
13	20 52.4	24 20	0.5912	1 21.8	314 0	8 32	0.4733
17	20 58.9	23 57	0.5928	1 12.6	314 45	8 37	0.4734
21	21 5.5	23 32	0.5942	1 3.4	315 29	8 42	0.4735
25	21 12.0	23 7	0.5953	0 54.2	316 14	8 47	0.4736
29	21 18.5	22 41	0.5962	0 44.9	316 59	8 51	0.4737
b. 2	21 25.0	22 15	0.5968	0 35.7	317 43	8 56	0.4738
6	21 31.5	21 48	0.5971	0 26.5	318 28	9 0	0.4739
10	21 38.0	21 21	0.5972	0 17.2	319 13	9 4	0.4739
14	21 44.4	20 53	0.5970	0 7.8	319 57	9 9	0.4740
18	21 50.7	20 25	* 0.5965	23 55.9	320 42	9 13	0.4741
22	21 57.0	19 57	0.5958	23 46.5	321 26	9 17	0.4741
26	22 3.3	19 29	0.5948	23 37.1	322 10	9 21	0.4742
c. 2	22 9.5	19 0	0.5935	23 27.6	322 55	9 25	0.4742
6	22 15.7	18 31	0.5920	23 18.0	323 40	9 28	0.4742
10	22 21.9	18 2	0.5902	23 8.4	324 24	9 32	0.4742
14	22 28.0	17 33	0.5882	22 58.7	325 9	9 36	0.4742
18	22 34.0	17 4	0.5859	22 48.9	325 54	9 39	0.4742
22	22 40.0	16 35	0.5834	22 39.1	326 38	9 43	0.4742
26	22 45.9	16 6	0.5806	22 29.2	327 23	9 46	0.4742
30	22 51.7	15 37	0.5775	22 19.3	328 8	9 49	0.4742
dil 3	22 57.5	15 9	0.5742	22 9.3	328 53	9 52	0.4742
7	23 3.2	14 41	0.5706	21 59.2	329 38	9 55	0.4742
11	23 8.8	14 13	0.5668	21 49.1	330 23	9 58	0.4742
15	23 14.3	13 46	0.5627	21 38.9	331 7	10 1	0.4742
19	23 19.8	13 19	0.5584	21 28.6	331 52	10 4	0.4742
23	23 25.2	12 53	0.5538	21 18.2	332 37	10 6	0.4741
27	23 30.5	12 28	0.5489	21 7.7	333 22	10 9	0.4741
y 1	23 35.7	12 4	0.5438	20 57.2	334 7	10 11	0.4740
5	23 40.9	S. 11 40	0.5384	20 46.6	334 52	S. 10 13	0.4739

## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Le Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	
1850.	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
May 5	23 40.9	S. 11 40	0.5384	20 46.6	334 52	S. 10 13	0.
9	23 45.9	11 17	0.5328	20 35.8	335 36	10 15	0.
13	23 50.8	10 55	0.5269	20 25.0	336 21	10 17	0.
17	23 55.7	10 34	0.5208	20 14.1	337 6	10 19	0.
21	0 0.4	10 14	0.5145	20 3.0	337 51	10 21	0.
25	0 5.0	9 55	0.5079	19 51.8	338 36	10 23	0.
29	0 9.4	9 38	0.5011	19 40.5	339 22	10 25	0.
June 2	0 13.7	9 22	0.4940	19 29.0	340 7	10 27	0.
6	0 17.9	9 7	0.4867	19 17.4	340 52	10 28	0.
10	0 21.9	8 54	0.4792	19 5.6	341 37	10 29	0.
14	0 25.8	8 42	0.4715	18 53.7	342 22	10 30	0.
18	0 29.5	8 32	0.4636	18 41.6	343 7	10 31	0.
22	0 33.0	8 24	0.4554	18 29.3	343 52	10 32	0.
26	0 36.3	8 18	0.4471	18 16.8	344 37	10 33	0.
30	0 39.4	8 13	0.4386	18 4.1	345 22	10 34	0.
July 4	0 42.2	8 10	0.4300	17 51.1	346 8	10 35	0.
8	0 44.8	8 9	0.4212	17 37.9	346 53	10 36	0.
12	0 47.2	8 10	0.4124	17 24.5	347 38	10 36	0.
16	0 49.3	8 14	0.4035	17 10.9	348 24	10 36	0.
20	0 51.1	8 20	0.3945	16 57.0	349 9	10 37	0.
24	0 52.6	8 28	0.3856	16 42.7	349 55	10 37	0.
28	0 53.8	8 37	0.3767	16 28.1	350 41	10 37	0.
Aug. 1	0 54.7	8 49	0.3679	16 13.2	351 26	10 37	0.
5	0 55.2	9 3	0.3593	15 57.9	352 12	10 37	0.
9	0 55.4	9 19	0.3509	15 42.3	352 58	10 37	0.
13	0 55.2	9 37	0.3428	15 26.4	353 43	10 37	0.
17	0 54.7	9 57	0.3350	15 10.1	354 29	10 36	0.
21	0 53.8	10 18	0.3276	14 53.4	355 15	10 35	0.
25	0 52.5	10 41	0.3207	14 36.3	356 1	10 35	0.
29	0 50.9	11 4	0.3144	14 18.9	356 47	10 34	0.
Sept. 2	0 48.9	11 28	0.3088	14 1.2	357 33	10 33	0.
6	0 46.6	S. 11 52	0.3039	13 43.1	358 19	S. 10 32	0.



## MEAN TIME.

Date.	Geocentric.				Heliocentric.		
	Right Ascension.	Declination.	Log. of Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1850.	h m	° '		h m	° '	° '	
Sept. 6	0 46.6	S. 11 52	0.3039	13 43.1	358 19	S. 10 32	0.4693
10	0 44.0	12 16	0.2998	13 24.8	359 5	10 31	0.4691
14	0 41.2	12 40	0.2965	13 6.2	359 51	10 29	0.4688
18	0 38.1	13 3	0.2942	12 47.4	0 37	10 28	0.4686
22	0 34.9	13 24	0.2928	12 28.5	1 23	10 27	0.4683
26	0 31.6	13 44	0.2924	12 9.5	2 9	10 25	0.4680
30	0 28.2	14 1	0.2930	11 50.4	2 55	10 24	0.4678
Oct. 4	0 24.8	14 15	0.2946	11 31.3	3 41	10 22	0.4675
8	0 21.5	14 27	0.2971	11 12.3	4 28	10 20	0.4672
12	0 18.3	14 36	0.3006	10 53.4	5 14	10 18	0.4669
16	0 15.3	14 42	0.3049	10 34.6	6 0	10 16	0.4666
20	0 12.5	14 44	0.3099	10 16.1	6 47	10 13	0.4663
24	0 10.0	14 43	0.3157	9 57.9	7 33	10 11	0.4660
28	0 7.8	14 39	0.3221	9 40.0	8 20	10 9	0.4657
Nov. 1	0 5.8	14 32	0.3292	9 22.4	9 7	10 6	0.4654
5	0 4.2	14 21	0.3367	9 5.1	9 53	10 3	0.4651
9	0 3.0	14 8	0.3446	8 48.2	10 40	10 0	0.4648
13	0 2.1	13 52	0.3529	8 31.7	11 27	9 57	0.4644
17	0 1.6	13 34	0.3614	8 15.5	12 14	9 54	0.4641
21	0 1.5	13 13	0.3701	7 59.7	13 1	9 51	0.4638
25	0 1.8	12 50	0.3789	7 44.3	13 48	9 48	0.4634
29	0 2.4	12 25	0.3878	7 29.2	14 35	9 45	0.4631
Dec. 3	0 3.3	11 58	0.3967	7 14.4	15 22	9 41	0.4628
7	0 4.5	11 29	0.4056	6 59.9	16 9	9 37	0.4624
11	0 6.1	10 59	0.4145	6 45.8	16 56	9 34	0.4621
15	0 8.0	10 28	0.4232	6 32.0	17 43	9 30	0.4617
19	0 10.2	9 55	0.4318	6 18.4	18 31	9 26	0.4613
23	0 12.7	9 21	0.4403	6 5.1	19 18	9 22	0.4610
27	0 15.4	8 46	0.4486	5 52.1	20 5	9 18	0.4607
31	0 18.3	8 9	0.4567	5 39.4	20 53	9 13	0.4603
35	0 21.5	S. 7 32	0.4645	5 26.9	21 40	S. 9 9	0.46

## EPHEMERIS OF CERES FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Ha Pa
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
June 26	0 36 50.48	+ 1.97	S. 8 16 27.6	+ 3.3	3.1
27	0 37 37.28	1.93	8 15 12.9	3.0	3.1
28	0 38 23.28	1.90	8 14 5.3	2.7	3.1
29	0 39 8.46	1.87	8 13 4.8	2.4	3.1
30	0 39 52.81	1.83	8 12 11.5	2.1	3.1
July 1	0 40 36.31	1.79	8 11 25.4	1.8	3.1
2	0 41 18.95	1.76	8 10 46.7	1.5	3.1
3	0 42 0.71	1.72	8 10 15.3	1.2	3.1
4	0 42 41.58	1.68	8 9 51.4	0.8	3.1
5	0 43 21.54	1.65	8 9 35.0	0.5	3.1
6	0 44 0.59	1.61	8 9 26.1	+ 0.2	3.1
7	0 44 38.70	1.57	8 9 24.9	- 0.1	3.1
8	0 45 15.86	1.53	8 9 31.4	0.4	3.1
9	0 45 52.05	1.49	8 9 45.6	0.8	3.1
10	0 46 27.27	1.45	8 10 7.5	1.1	3.1
11	0 47 1.49	1.41	8 10 37.3	1.4	3.1
12	0 47 34.71	1.37	8 11 14.9	1.7	3.1
13	0 48 6.92	1.32	8 12 0.4	2.1	3.1
14	0 48 38.09	1.28	8 12 53.7	2.4	3.1
15	0 49 8.22	1.23	8 13 54.9	2.7	3.1
16	0 49 37.30	1.19	8 15 4.1	3.0	3.1
17	0 50 5.31	1.14	8 16 21.1	3.4	3.1
18	0 50 32.25	1.10	8 17 46.1	3.7	3.1
19	0 50 58.09	1.05	8 19 19.0	4.0	3.1
20	0 51 22.82	1.01	8 20 59.9	4.4	3.1
21	0 51 46.44	0.96	8 22 48.7	4.7	3.1
22	0 52 8.93	0.91	8 24 45.5	5.0	3.1
23	0 52 30.27	0.87	8 26 50.2	5.4	3.1
24	0 52 50.46	0.82	8 29 2.9	5.7	3.1
25	0 53 9.47	0.77	8 31 23.6	6.0	3.1
26	0 53 27.29	+ 0.72	S. 8 33 52.3	- 6.4	3.1



## EPHEMERIS OF CERES FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
July 26	0 53 27.29	-1 0.72	S. 8 33 52.3	- 6.4	3.6
27	0 53 43.91	0.67	8 36 28.9	6.7	3.6
28	0 53 59.32	0.62	8 39 13.4	7.0	3.6
29	0 54 13.50	0.56	8 42 5.8	7.4	3.6
30	0 54 26.43	0.51	8 45 6.2	7.7	3.6
31	0 54 38.11	0.46	8 48 14.3	8.0	3.7
August 1	0 54 48.53	0.41	8 51 30.2	8.3	3.7
2	0 54 57.67	0.35	8 54 53.9	8.6	3.7
3	0 55 5.51	0.30	8 58 25.2	9.0	3.7
4	0 55 12.03	0.24	9 2 4.1	9.3	3.7
5	0 55 17.23	0.19	9 5 50.6	9.6	3.7
6	0 55 21.11	0.13	9 9 44.4	9.9	3.8
7	0 55 23.65	0.08	9 13 45.5	10.2	3.8
8	0 55 24.85	+ 0.02	9 17 53.8	10.5	3.8
9	0 55 24.70	- 0.03	9 22 9.1	10.8	3.8
10	0 55 23.20	0.09	9 26 31.4	11.1	3.8
11	0 55 20.34	0.15	9 31 0.4	11.3	3.9
12	0 55 16.13	0.20	9 35 36.0	11.6	3.9
13	0 55 10.56	0.26	9 40 18.0	11.9	3.9
14	0 55 3.62	0.32	9 45 6.4	12.1	3.9
15	0 54 55.31	0.37	9 50 0.8	12.4	3.9
16	0 54 45.65	0.43	9 55 1.1	12.6	3.9
17	0 54 34.62	0.49	10 0 7.1	12.9	4.0
18	0 54 22.23	0.54	10 5 18.6	13.1	4.0
19	0 54 8.48	0.60	10 10 35.3	13.3	4.0
20	0 53 53.38	0.66	10 15 57.1	13.5	4.0
21	0 53 36.92	0.71	10 21 23.8	13.7	4.0
22	0 53 19.12	0.77	10 26 55.0		4.0
23	0 52 59.98	0.83	10 32 30.5		4.1
24	0 52 39.50	0.88	10 38 10.1		4.1
25	0 52 17.69	- 0.94	S. 10 43 53		1

## EPHEMERIS OF CERES FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
August 25	0 52 17.69	— 0.94	S. 10 43 53.6	— 14.4	4.1
26	0 51 54.57	0.99	10 49 40.5	14.5	4.1
27	0 51 30.13	1.05	10 55 30.7	14.7	4.1
28	0 51 4.39	1.10	11 1 23.9	14.8	4.1
29	0 50 37.36	1.15	11 7 19.7	14.9	4.2
30	0 50 9.07	1.21	11 13 17.8	15.0	4.2
31	0 49 39.52	1.26	11 19 17.8	15.0	4.2
September 1	0 49 8.74	1.31	11 25 19.5	15.1	4.2
2	0 48 36.75	1.36	11 31 22.5	15.1	4.2
3	0 48 3.56	1.41	11 37 26.4	15.2	4.2
4	0 47 29.20	1.46	11 43 30.8	15.2	4.2
5	0 46 53.71	1.50	11 49 35.2	15.2	4.2
6	0 46 17.12	1.55	11 55 39.4	15.2	4.3
7	0 45 39.46	1.59	12 1 43.0	15.1	4.3
8	0 45 0.75	1.63	12 7 45.4	15.1	4.3
9	0 44 21.04	1.67	12 13 46.3	15.0	4.3
10	0 43 40.37	1.71	12 19 45.2	14.9	4.3
11	0 42 58.77	1.75	12 25 41.9	14.8	4.3
12	0 42 16.28	1.79	12 31 35.8	14.7	4.3
13	0 41 32.94	1.82	12 37 26.5	14.5	4.3
14	0 40 48.79	1.86	12 43 13.7	14.4	4.3
15	0 40 3.88	1.89	12 48 56.9	14.2	4.3
16	0 39 18.25	1.92	12 54 35.7	14.0	4.3
17	0 38 31.94	1.94	13 0 9.8	13.8	4.4
18	0 37 45.00	1.97	13 5 38.8	13.6	4.4
19	0 36 57.48	1.99	13 11 2.2	13.4	4.4
20	0 36 9.41	2.01	13 16 19.8	13.1	4.4
21	0 35 20.85	2.03	13 21 31.1	12.8	4.4
22	0 34 31.85	2.05	13 26 35.7	12.5	4.4
23	0 33 42.45	2.07	13 31 33.4	12.2	4.4
8 24	0 32 52.71	— 2.08	S. 13 36 23.7	— 11.9	4.4



## EPHEMERIS OF CERES FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
September 24	0 32 52.71	— 2.08	S. 13 36 23.7	— 11.9	4.4
25	0 32 2.67	2.09	13 41 6.4	11.6	4.4
26	0 31 12.39	2.10	13 45 41.0	11.3	4.4
27	0 30 21.92	2.11	13 50 7.3	10.9	4.4
28	0 29 31.30	2.11	13 54 25.0	10.6	4.4
29	0 28 40.61	2.11	13 58 33.7	10.2	4.4
30	0 27 49.89	2.11	14 2 33.0	9.8	4.4
October 1	0 26 59.19	2.11	14 6 22.7	9.4	4.4
2	0 26 8.58	2.11	14 10 2.6	8.9	4.4
3	0 25 18.10	2.10	14 13 32.2	8.5	4.4
4	0 24 27.82	2.09	14 16 51.4	8.1	4.4
5	0 23 37.79	2.08	14 19 59.9	7.6	4.3
6	0 22 48.06	2.06	14 22 57.6	7.2	4.3
7	0 21 58.70	2.05	14 25 44.1	6.7	4.3
8	0 21 9.76	2.03	14 28 19.4	6.2	4.3
9	0 20 21.30	2.01	14 30 43.2	5.8	4.3
10	0 19 33.35	1.99	14 32 55.5	5.3	4.3
11	0 18 45.98	1.96	14 34 56.1	4.8	4.3
12	0 17 59.23	1.93	14 36 44.8	4.3	4.3
13	0 17 13.15	1.90	14 38 21.6	3.8	4.3
14	0 16 27.78	1.87	14 39 46.3	3.3	4.3
15	0 15 43.17	1.84	14 40 58.9	2.8	4.3
16	0 14 59.36	1.81	14 41 59.4	2.3	4.3
17	0 14 16.39	1.77	14 42 47.8	1.8	4.2
18	0 13 34.29	1.74	14 43 24.0	1.3	4.2
19	0 12 53.11	1.70	14 43 48.0	0.7	4.2
20	0 12 12.88	1.66	14 43 59.8	— 0.2	4.2
21	0 11 33.63	1.61	14 43 59.6	+ 0.3	
22	0 10 55.40	1.57	14 43 47.3	0.8	
23	0 10 18.21	1.53	14 43 22.9	1.2	
24	0 9 42.09	— 1.48	S. 14 42 46.4	+ 1	

## EPHEMERIS OF CERES FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hour of Pa
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>s</sup>
October 24	0 9 42.09	- 1.48	S. 14 42 46.4	+ 1.8	4.7
25	0 9 7.09	1.43	14 41 58.0	2.3	4.7
26	0 8 33.22	1.39	14 40 57.6	2.8	4.7
27	0 8 0.51	1.34	14 39 45.4	3.3	4.7
28	0 7 28.98	1.29	14 38 21.5	3.7	4.7
29	0 6 58.66	1.24	14 36 45.8	4.2	4.7
30	0 6 29.58	1.19	14 34 58.5	4.7	4.7
31	0 6 1.75	1.13	14 32 59.7	5.2	4.7
November 1	0 5 35.20	1.08	14 30 49.5	5.7	4.7
2	0 5 9.95	1.02	14 28 28.0	6.1	4.7
3	0 4 46.02	0.97	14 25 55.3	6.6	4.7
4	0 4 23.41	0.91	14 23 11.5	7.1	4.7
5	0 4 2.14	0.86	14 20 16.8	7.5	4.7
6	0 3 42.23	0.80	14 17 11.4	7.9	3.7
7	0 3 23.68	0.74	14 13 55.4	8.4	3.7
8	0 3 6.51	0.69	14 10 28.9	8.8	3.7
9	0 2 50.71	0.63	14 6 52.1	9.2	3.7
10	0 2 36.29	0.57	14 3 5.1	9.7	3.7
11	0 2 23.26	0.51	13 59 8.2	10.1	3.7
12	0 2 11.62	0.46	13 55 1.5	10.5	3.7
13	0 2 1.37	0.40	13 50 45.1	10.9	3.7
14	0 1 52.51	0.34	13 46 19.3	11.3	3.7
15	0 1 45.03	0.28	13 41 44.2	11.7	3.7
16	0 1 38.93	0.23	13 37 0.0	12.0	3.7
17	0 1 34.21	0.17	13 32 6.8	12.4	3.7
18	0 1 30.86	0.11	13 27 4.9	12.8	3.7
19	0 1 28.87	- 0.05	13 21 54.4	13.1	3.7
20	0 1 28.24	0.00	13 16 35.5	13.5	3.7
21	0 1 28.96	+ 0.06	13 11 8.3	13.8	3.7
22	0 1 31.03	0.11	13 5 33.0	14.1	3.7
23	0 1 34.43	+ 0.17	S. 12 59 49.8	+ 14.5	3.7



## EPHEMERIS OF CERES FOR THE OPPOSITION.

At Transit over the Meridian of Greenwich.

Date.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Hor. Par.
1850.	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>
vember 23	0 1 34.43	+ 0.17	S. 12 59 49.8	+ 14.5	3.6
24	0 1 39.16	0.22	12 53 58.8	14.8	3.6
25	0 1 45.22	0.28	12 48 0.1	15.1	3.6
26	0 1 52.59	0.33	12 41 53.9	15.4	3.6
27	0 2 1.27	0.39	12 35 40.4	15.7	3.5
28	0 2 11.25	0.44	12 29 19.6	16.0	3.5
29	0 2 22.52	0.50	12 22 51.7	16.3	3.5
30	0 2 35.07	0.55	12 16 16.9	16.6	3.5
ember 1	0 2 48.89	0.60	12 9 35.4	16.9	3.5
2	0 3 3.97	0.65	12 2 47.2	17.1	3.5
3	0 3 20.30	0.71	11 55 52.4	17.4	3.4
4	0 3 37.86	0.76	11 48 51.3	17.7	3.4
5	0 3 56.65	0.81	11 41 44.0	17.9	3.4
6	0 4 16.65	0.86	11 34 30.6	18.2	3.4
7	0 4 37.85	0.91	11 27 11.2	18.4	3.4
8	0 5 0.23	0.96	11 19 46.0	18.7	3.4
9	0 5 23.78	1.01	11 12 15.1	18.9	3.3
10	0 5 48.49	1.05	11 4 38.7	19.1	3.3
11	0 6 14.33	1.10	10 56 56.8	19.4	3.3
12	0 6 41.30	1.15	10 49 9.7	19.6	3.3
13	0 7 9.37	1.19	10 41 17.5	19.8	3.3
14	0 7 38.53	1.24	10 33 20.3	20.0	3.3
15	0 8 8.76	1.28	10 25 18.1	20.2	3.2
16	0 8 40.06	1.33	10 17 11.2	20.4	3.2
17	0 9 12.40	1.37	10 8 59.7	20.6	3.2
18	0 9 45.76	1.41	10 0 43.7	20.8	3.2
19	0 10 20.14	1.45	9 52 23.2		3.2
20	0 10 55.52	1.49	9 43 58.7		
21	0 11 31.88	1.54	9 35 29.2		
22	0 12 9.21	1.58	9 26		
23	0 12 47.51	+ 1.62	S. 9 17		

## JANUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rel.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 36 21.36	N.3 56 30.9	0.7022452	16 50.5	163 3 50.2	N.1 10 51.1	0.733
2	11 36 25.91	3 56 20.0	.7009343	16 46.6	163 8 25.7	1 10 53.8	.733
3	11 36 29.75	3 56 13.6	.6996270	16 42.8	163 13 1.2	1 10 56.5	.733
4	11 36 32.89	3 56 11.8	.6983237	16 38.9	163 17 36.7	1 10 59.3	.734
5	11 36 35.33	3 56 14.6	.6970251	16 35.0	163 22 12.2	1 11 2.0	.734
6	11 36 37.06	3 56 21.9	.6957314	16 31.1	163 26 47.7	1 11 4.7	.734
7	11 36 38.07	3 56 33.9	.6944432	16 27.1	163 31 23.1	1 11 7.4	.734
8	11 36 38.37	3 56 50.4	.6931612	16 23.2	163 35 58.6	1 11 10.1	.734
9	11 36 37.95	3 57 11.5	.6918857	16 19.3	163 40 34.0	1 11 12.8	.734
10	11 36 36.82	3 57 37.1	.6906174	16 15.3	163 45 9.4	1 11 15.4	.734
11	11 36 34.97	3 58 7.4	.6893569	16 11.3	163 49 44.7	1 11 18.1	.734
12	11 36 32.40	3 58 42.2	.6881046	16 7.4	163 54 20.1	1 11 20.8	.734
13	11 36 29.12	3 59 21.7	.6868610	16 3.4	163 58 55.4	1 11 23.4	.734
14	11 36 25.13	4 0 5.6	.6856268	15 59.4	164 3 30.7	1 11 26.1	.734
15	11 36 20.42	4 0 54.1	.6844026	15 55.3	164 8 6.0	1 11 28.7	.734
16	11 36 15.00	4 1 47.0	.6831888	15 51.3	164 12 41.3	1 11 31.3	.734
17	11 36 8.88	4 2 44.5	.6819860	15 47.3	164 17 16.6	1 11 33.9	.734
18	11 36 2.06	4 3 46.4	.6807948	15 43.2	164 21 51.8	1 11 36.6	.734
19	11 35 54.54	4 4 52.7	.6796158	15 39.1	164 26 27.1	1 11 39.2	.734
20	11 35 46.32	4 6 3.4	.6784494	15 35.1	164 31 2.3	1 11 41.8	.734
21	11 35 37.41	4 7 18.4	.6772962	15 31.0	164 35 37.5	1 11 44.3	.734
22	11 35 27.81	4 8 37.7	.6761568	15 26.9	164 40 12.6	1 11 46.9	.734
23	11 35 17.54	4 10 1.3	.6750316	15 22.8	164 44 47.8	1 11 49.5	.734
24	11 35 6.59	4 11 29.1	.6739212	15 18.7	164 49 22.9	1 11 52.1	.734
25	11 34 54.98	4 13 1.0	.6728261	15 14.5	164 53 58.0	1 11 54.6	.734
26	11 34 42.70	4 14 37.0	.6717468	15 10.4	164 58 33.1	1 11 57.2	.734
27	11 34 29.77	4 16 17.1	.6706839	15 6.2	165 3 8.2	1 11 59.7	.734
28	11 34 16.18	4 18 1.2	.6696379	15 2.1	165 7 43.3	1 12 2.3	.734
29	11 34 1.95	4 19 49.2	.6686092	14 57.9	165 12 18.3	1 12 4.8	.734
30	11 33 47.09	4 21 41.1	.6675984	14 53.7	165 16 53.3	1 12 7.3	.734
31	11 33 31.60	4 23 36.9	.6666061	14 49.5	165 21 28.4	1 12 9.8	.734
32	11 33 15.48	N.4 25 36.5	0.6656327	14 45.3	165 26 3.4	N.1 12 12.3	0.734



## JANUARY, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
1	<sup>h</sup> 11 <sup>m</sup> 36 <sup>s</sup> 24.63	+ 0.18	1.32	N. 3 56 22.7	- 0.4	18.4	1.7
2	11 36 28.67	0.16	1.32	3 56 15.1	- 0.2	18.4	1.7
3	11 36 32.02	0.12	1.33	3 56 11.9	0.0	18.5	1.7
4	11 36 34.66	0.10	1.33	3 56 13.3	+ 0.2	18.5	1.7
5	11 36 36.60	0.07	1.34	3 56 19.2	0.3	18.6	1.7
6	11 36 37.83	0.04	1.34	3 56 29.6	0.5	18.6	1.7
7	11 36 38.35	+ 0.01	1.34	3 56 44.6	0.7	18.7	1.7
8	11 36 38.16	- 0.02	1.35	3 57 4.2	0.9	18.8	1.7
9	11 36 37.26	0.05	1.35	3 57 28.4	1.1	18.8	1.7
10	11 36 35.65	0.08	1.36	3 57 57.1	1.3	18.9	1.8
11	11 36 33.32	0.11	1.36	3 58 30.4	1.5	18.9	1.8
12	11 36 30.28	0.14	1.37	3 59 8.2	1.7	19.0	1.8
13	11 36 26.53	0.17	1.37	3 59 50.5	1.9	19.0	1.8
14	11 36 22.07	0.20	1.37	4 0 37.4	2.0	19.1	1.8
15	11 36 16.90	0.23	1.37	4 1 28.7	2.2	19.1	1.8
16	11 36 11.04	0.26	1.38	4 2 24.5	2.4	19.2	1.8
17	11 36 4.47	0.29	1.38	4 3 24.7	2.6	19.3	1.8
18	11 35 57.21	0.32	1.38	4 4 29.3	2.8	19.3	1.8
19	11 35 49.25	0.35	1.39	4 5 38.3	3.0	19.4	1.8
20	11 35 40.61	0.37	1.39	4 6 51.6	3.1	19.4	1.8
21	11 35 31.28	0.40	1.40	4 8 9.2	3.3	19.5	1.8
22	11 35 21.28	0.43	1.40	4 9 31.0	3.5	19.6	1.8
23	11 35 10.60	0.46	1.41	4 10 57.1	3.7	19.6	1.8
24	11 34 59.26	0.49	1.41	4 12 27.2	3.8	19.7	1.8
25	11 34 47.26	0.51	1.41	4 14 1.5	4.0	19.7	1.8
26	11 34 34.60	0.54	1.42	4 15 39.8	4.2	19.8	1.8
27	11 34 21.29	0.57	1.42	4 17 22.1	4.3	19.8	1.8
28	11 34 7.34	0.59	1.42	4 19 8.4	4.5	19.8	
29	11 33 52.76	0.62	1.42	4 20 58.5	4.7	19.8	
30	11 33 37.55	0.65	1.43	4 22 52.5	4.8	19.8	
31	11 33 21.72	0.67	1.43	4 24 50.3	5.0	19.8	
32	11 33 5.27	- 0.70	1.44	N. 4 26 51.8	+ 5.1	19.8	

## FEBRUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	L Rad
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 33 15.48	N.4 25 36.5	0.6656327	14 45.3	165 26 3.4	N.1 12 12.3	0.73
2	11 32 58.76	4 27 39.7	.6646789	14 41.1	165 30 38.3	1 12 14.8	.73
3	11 32 41.43	4 29 46.6	.6637451	14 36.9	165 35 13.3	1 12 17.3	.73
4	11 32 23.51	4 31 57.0	.6628318	14 32.6	165 39 48.2	1 12 19.8	.73
5	11 32 5.00	4 34 10.9	.6619396	14 28.4	165 44 23.2	1 12 22.3	.73
6	11 31 45.92	4 36 28.2	.6610691	14 24.2	165 48 58.1	1 12 24.7	.73
7	11 31 26.28	4 38 48.8	.6602207	14 19.9	165 53 33.0	1 12 27.2	.73
8	11 31 6.09	4 41 12.6	.6593951	14 15.6	165 58 7.8	1 12 29.6	.73
9	11 30 45.37	4 43 39.5	.6585926	14 11.3	166 2 42.7	1 12 32.1	.73
10	11 30 24.12	4 46 9.5	.6578139	14 7.0	166 7 17.5	1 12 34.5	.73
11	11 30 2.36	4 48 42.4	.6570595	14 2.7	166 11 52.4	1 12 36.9	.73
12	11 29 40.11	4 51 18.1	.6563297	13 58.4	166 16 27.2	1 12 39.3	.73
13	11 29 17.37	4 53 56.5	.6556251	13 54.1	166 21 2.0	1 12 41.8	.73
14	11 28 54.18	4 56 37.5	.6549460	13 49.8	166 25 36.7	1 12 44.2	.73
15	11 28 30.54	4 59 21.0	.6542930	13 45.5	166 30 11.5	1 12 46.6	.73
16	11 28 6.47	5 2 6.9	.6536663	13 41.1	166 34 46.2	1 12 48.9	.73
17	11 27 41.99	5 4 55.0	.6530665	13 36.8	166 39 21.0	1 12 51.3	.73
18	11 27 17.12	5 7 45.3	.6524937	13 32.4	166 43 55.7	1 12 53.7	.73
19	11 26 51.86	5 10 37.6	.6519484	13 28.1	166 48 30.3	1 12 56.1	.73
20	11 26 26.25	5 13 31.8	.6514309	13 23.7	166 53 5.0	1 12 58.4	.73
21	11 26 0.30	5 16 27.7	.6509413	13 19.4	166 57 39.7	1 13 0.8	.73
22	11 25 34.02	5 19 25.3	.6504801	13 15.0	167 2 14.3	1 13 3.1	.73
23	11 25 7.44	5 22 24.4	.6500474	13 10.6	167 6 48.9	1 13 5.4	.73
24	11 24 40.57	5 25 24.8	.6496435	13 6.3	167 11 23.5	1 13 7.8	.73
25	11 24 13.43	5 28 26.5	.6492686	13 1.9	167 15 58.1	1 13 10.1	.73
26	11 23 46.04	5 31 29.3	.6489229	12 57.5	167 20 32.6	1 13 12.4	.73
27	11 23 18.42	5 34 33.1	.6486067	12 53.1	167 25 7.2	1 13 14.7	.73
28	11 22 50.59	5 37 37.8	.6483201	12 48.7	167 29 41.7	1 13 17.0	.73
29	11 22 22.57	N.5 40 43.2	0.6480632	12 44.3	167 34 16.2	N.1 13 19.3	0.73



## FEBRUARY, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	11 33 52.7	- 0.70	1.44	N. 4 26 51.8	+ 5.1	20.0	1.9
2	11 32 48.23	0.72	1.45	4 28 56.9	5.3	20.0	1.9
3	11 32 30.59	0.75	1.46	4 31 5.6	5.4	20.1	1.9
4	11 32 12.36	0.77	1.46	4 33 17.7	5.6	20.1	1.9
5	11 31 53.57	0.79	1.46	4 35 33.3	5.7	20.2	1.9
6	11 31 34.21	0.82	1.47	4 37 52.2	5.9	20.2	1.9
7	11 31 14.29	0.84	1.47	4 40 14.3	6.0	20.3	1.9
8	11 30 53.84	0.86	1.47	4 42 39.5	6.1	20.3	1.9
9	11 30 32.87	0.88	1.47	4 45 7.8	6.2	20.3	1.9
10	11 30 11.38	0.91	1.47	4 47 39.1	6.4	20.4	1.9
11	11 29 49.40	0.93	1.47	4 50 13.2	6.5	20.4	1.9
12	11 29 26.93	0.95	1.47	4 52 50.0	6.6	20.4	1.9
13	11 29 3.99	0.97	1.48	4 55 29.4	6.7	20.5	1.9
14	11 28 40.61	0.98	1.48	4 58 11.4	6.8	20.5	1.9
15	11 28 16.79	1.00	1.48	5 0 55.8	6.9	20.5	1.9
16	11 27 52.56	1.02	1.49	5 3 42.5	7.0	20.6	1.9
17	11 27 27.93	1.03	1.49	5 6 31.4	7.1	20.6	1.9
18	11 27 2.91	1.05	1.49	5 9 22.3	7.2	20.6	1.9
19	11 26 37.53	1.06	1.49	5 12 15.2	7.2	20.6	1.9
20	11 26 11.81	1.08	1.50	5 15 9.8	7.3	20.7	1.9
21	11 25 45.75	1.09	1.50	5 18 6.1	7.4	20.7	1.9
22	11 25 19.38	1.10	1.50	5 21 4.0	7.4	20.7	1.9
23	11 24 52.72	1.12	1.50	5 24 3.3	7.5	20.7	1.9
24	11 24 25.78	1.13	1.50	5 27 3.9	7.5	20.8	1.9
25	11 23 58.59	1.14	1.50		7.6	20.8	1.9
26	11 23 31.16	1.15	1		7.6	20.8	1.9
27	11 23 3.51	1.16	1		7.7	20.8	1.9
28	11 22 35.65	1.17	1		7.7	20.8	1.9
29	11 22 7.62	- 1.17				20.8	1.9

MARCH, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 22 22.57	N. 5 40 43.2	0.6480632	12 44.3	167 34 16.2	N. 1 13 19.3	0.7347
2	11 21 54.37	5 43 49.2	.6478362	12 39.9	167 38 50.7	1 13 21.6	.7347
3	11 21 26.01	5 46 55.7	.6476394	12 35.5	167 43 25.2	1 13 23.8	.7347
4	11 20 57.52	5 50 2.6	.6474728	12 31.1	167 47 59.7	1 13 26.1	.7347
5	11 20 28.91	5 53 9.7	.6473365	12 26.7	167 52 34.1	1 13 28.4	.7347
6	11 20 0.21	5 56 16.9	.6472308	12 22.3	167 57 8.6	1 13 30.6	.7347
7	11 19 31.43	5 59 24.1	.6471556	12 17.9	168 1 43.0	1 13 32.8	.7348
8	11 19 2.59	6 2 31.1	.6471111	12 13.5	168 6 17.4	1 13 35.1	.7348
9	11 18 33.72	6 5 37.7	.6470973	12 9.1	168 10 51.8	1 13 37.3	.7348
10	11 18 4.84	6 8 43.9	.6471141	12 4.6	168 15 26.2	1 13 39.5	.7348
11	11 17 35.98	6 11 49.5	.6471616	12 0.2	168 20 0.6	1 13 41.7	.7348
12	11 17 7.14	6 14 54.4	.6472398	11 55.8	168 24 34.9	1 13 43.9	.7348
13	11 16 38.36	6 17 58.4	.6473487	11 51.4	168 29 9.3	1 13 46.1	.7348
14	11 16 9.65	6 21 1.4	.6474881	11 47.0	168 33 43.6	1 13 48.3	.7348
15	11 15 41.05	6 24 3.2	.6476578	11 42.6	168 38 17.9	1 13 50.5	.7348
16	11 15 12.56	6 27 3.7	.6478577	11 38.2	168 42 52.2	1 13 52.6	.7349
17	11 14 44.21	6 30 2.9	.6480876	11 33.8	168 47 26.5	1 13 54.8	.7349
18	11 14 16.02	6 33 0.5	.6483474	11 29.4	168 52 0.7	1 13 57.0	.7349
19	11 13 48.02	6 35 56.4	.6486367	11 25.0	168 56 35.0	1 13 59.1	.7349
20	11 13 20.22	6 38 50.6	.6489554	11 20.6	169 1 9.2	1 14 1.2	.7349
21	11 12 52.64	6 41 42.9	.6493032	11 16.2	169 5 43.4	1 14 3.4	.7349
22	11 12 25.29	6 44 33.1	.6496797	11 11.9	169 10 17.6	1 14 5.5	.7349
23	11 11 58.21	6 47 21.3	.6500847	11 7.5	169 14 51.8	1 14 7.6	.7349
24	11 11 31.40	6 50 7.2	.6505180	11 3.1	169 19 26.0	1 14 9.7	.7349
25	11 11 4.88	6 52 50.8	.6509791	10 58.7	169 24 0.2	1 14 11.8	.7350
26	11 10 38.68	6 55 31.9	.6514677	10 54.4	169 28 34.3	1 14 13.9	.7350
27	11 10 12.80	6 58 10.6	.6519835	10 50.0	169 33 8.5	1 14 16.0	.7350
28	11 9 47.26	7 0 46.6	.6525262	10 45.6	169 37 42.6	1 14 18.0	.7350
29	11 9 22.08	7 3 19.8	.6530954	10 41.3	169 42 16.7	1 14 20.1	.7350
30	11 8 57.28	7 5 50.3	.6536907	10 37.0	169 46 50.8	1 14 22.1	.7350
31	11 8 32.87	7 8 17.9	.6543117	10 32.6	169 51 24.9	1 14 24.2	.7350
32	11 8 8.87	N. 7 10 42.5	0.6549581	10 28.3	169 55 59.0	N. 1 14 26.2	0.7350



## MARCH, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup> 11 22 7.62	— 1.17	1.50	N. 5 42 21.9	+ 7.7	20.8	1.9
11 21 39.42	1.18	1.50	5 45 27.6	7.8	20.8	1.9
11 21 11.08	1.18	1.50	5 48 33.8	7.8	20.8	1.9
11 20 42.61	1.19	1.50	5 51 40.2	7.8	20.8	1.9
11 20 14.04	1.19	1.51	5 54 46.8	7.8	20.9	1.9
11 19 45.38	1.20	1.51	5 57 53.4	7.8	20.9	1.9
11 19 16.66	1.20	1.51	6 0 59.9	7.8	20.9	1.9
11 18 47.89	1.20	1.51	6 4 6.2	7.8	20.9	1.9
11 18 19.10	1.20	1.51	6 7 12.1	7.7	20.9	1.9
11 17 50.31	1.20	1.51	6 10 17.4	7.7	20.9	1.9
11 17 21.55	1.20	1.51	6 13 22.1	7.7	20.9	1.9
11 16 52.83	1.20	1.51	6 16 26.0	7.6	20.9	1.9
11 16 24.16	1.19	1.51	6 19 28.9	7.6	20.9	1.9
11 15 55.59	1.19	1.51	6 22 30.8	7.6	20.8	1.9
11 15 27.13	1.18	1.51	6 25 31.5	7.5	20.8	1.9
11 14 58.79	1.18	1.51	6 28 30.8	7.4	20.8	1.9
11 14 30.61	1.17	1.51	6 31 28.7	7.4	20.8	1.9
11 14 2.59	1.16	1.51	6 34 25.0	7.3	20.8	1.9
11 13 34.77	1.15	1.51	6 37 19.6	7.2	20.8	1.9
11 13 7.16	1.15	1.51	6 40 12.3	7.2	20.8	1.9
11 12 39.77	1.14	1.51	6 43 3.1	7.1	20.8	1.9
11 12 12.63	1.13	1.50	6 45 51.9	7.0	20.7	1.9
11 11 45.75	1.11	1.50	6 48 38.5	6.9	20.7	1.9
11 11 19.15	1.10	1.50	6 51 22.8	6.8	20.7	1.9
11 10 52.85	1.09	1.50	6 54 4.8	6.7	20.7	1.9
11 10 26.87	1.08	1.49	6 56 44.3	6.6	20.6	1.9
11 10 1.22	1.06	1.49	6 59 21.3	6.5	20.6	1.9
11 9 35.92	1.05	1.49	7 1 55.6	6.4	20.6	1.9
11 9 10.99	1.03	1.49	7 4 27.2	6.2	20.6	1.9
11 8 46.43	1.01	1.48	7 6 55.9	6.1	20.5	1.9
11 8 22.27	1.00	1.48	7 9 21.7	6.0	20.5	1.9
11 7 58.52	— 0.98	1.48	N. 7 11 44.6	+ 5.9	20.5	1.9

## APRIL, 1850.

At Transit over the Meridian of Greenwich.

Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
h m s	s	s	° ' "	"	"	"
1 7 58.52	- 0.98	1.48	N. 7 11 44.6	+ 5.9	20.5	1.9
1 7 35.20	0.96	1.48	7 14 4.3	5.8	20.4	1.9
1 7 12.32	0.94	1.48	7 16 20.9	5.6	20.4	1.9
1 6 49.89	0.92	1.48	7 18 34.2	5.5	20.4	1.9
1 6 27.93	0.90	1.47	7 20 44.2	5.4	20.3	1.9
1 6 6.45	0.88	1.47	7 22 50.8	5.2	20.3	1.9
1 5 45.47	0.86	1.47	7 24 53.9	5.1	20.2	1.9
1 5 24.99	0.84	1.47	7 26 53.5	4.9	20.2	1.9
1 5 5.04	0.82	1.47	7 28 49.5	4.8	20.2	1.9
1 4 45.62	0.80	1.46	7 30 41.8	4.6	20.1	1.9
1 4 26.75	0.77	1.46	7 32 30.3	4.4	20.1	1.9
1 4 8.44	0.75	1.46	7 34 15.1	4.3	20.0	1.9
1 3 50.70	0.73	1.46	7 35 55.9	4.1	20.0	1.9
1 3 33.54	0.70	1.45	7 37 32.9	4.0	19.9	1.9
1 3 16.97	0.68	1.45	7 39 6.0	3.8	19.9	1.8
1 3 1.00	0.65	1.44	7 40 35.1	3.6	19.8	1.8
1 2 45.64	0.63	1.44	7 42 0.1	3.5	19.8	1.8
1 2 30.89	0.60	1.43	7 43 21.1	3.3	19.8	1.8
1 2 16.76	0.58	1.43	7 44 38.0	3.1	19.8	1.8
1 2 3.26	0.55	1.43	7 45 50.7	2.9	19.7	1.8
1 1 50.39	0.52	1.43	7 46 59.3	2.8	19.7	1.8
1 1 38.15	0.50	1.42	7 48 3.8	2.6	19.6	1.8
1 1 26.56	0.47	1.42	7 49 4.1	2.4	19.6	1.8
1 1 15.62	0.44	1.41	7 50 0.2	2.3	19.5	1.8
1 1 5.33	0.42	1.41	7 50 52.0	2.1	19.5	1.8
1 0 55.69	0.39	1.40	7 51 39.7	1.9	19.4	1.8
1 0 46.71	0.36	1.40	7 52 23.1	1.7	19.3	1.8
1 0 38.39	0.33	1.40	7 53 2.2	1.5	19.3	1.8
1 0 30.73	0.31	1.39	7 53 37.1	1.4	19.2	1.8
1 0 23.73	0.28	1.39	7 54 7.8	1.2	19.1	1.8
1 0 17.40	- 0.25	1.38	N. 7 54 34.2	+ 1.0		



# JUPITER.

393

## MAY, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	11 0 17.40	— 0.25	1.38	N. 7 54 34.2	+ 1.0	19.1	1.8
2	11 0 11.74	0.22	1.38	7 54 56.4	0.8	19.1	1.8
3	11 0 6.75	0.19	1.37	7 55 14.3	0.7	19.0	1.8
4	11 0 2.44	0.17	1.37	7 55 27.9	0.5	19.0	1.8
5	10 59 58.80	0.14	1.37	7 55 37.2	0.3	18.9	1.8
6	10 59 55.84	0.11	1.36	7 55 42.2	+ 0.1	18.8	1.8
7	10 59 53.56	0.08	1.36	7 55 43.0	— 0.1	18.8	1.7
8	10 59 51.96	0.05	1.36	7 55 39.6	0.2	18.7	1.7
9	10 59 51.04	— 0.02	1.36	7 55 31.8	0.4	18.7	1.7
10	10 59 50.80	0.00	1.35	7 55 19.8	0.6	18.6	1.7
11	10 59 51.23	+ 0.03	1.34	7 55 3.6	0.8	18.5	1.7
12	10 59 52.35	0.06	1.34	7 54 43.1	0.9	18.5	1.7
13	10 59 54.14	0.09	1.33	7 54 18.5	1.1	18.5	1.7
14	10 59 56.61	0.12	1.33	7 53 49.6	1.3	18.5	1.7
15	10 59 59.76	0.15	1.33	7 53 16.5	1.5	18.4	1.7
16	11 0 3.57	0.17	1.33	7 52 39.3	1.6	18.4	1.7
17	11 0 8.05	0.20	1.32	7 51 57.9	1.8	18.3	1.7
18	11 0 13.19	0.23	1.31	7 51 12.3	2.0	18.2	1.7
19	11 0 19.00	0.26	1.31	7 50 22.7	2.2	18.2	1.7
20	11 0 25.46	0.28	1.30	7 49 29.0	2.3	18.1	1.7
21	11 0 32.58	0.31	1.30	7 48 31.3	2.5	18.1	1.7
22	11 0 40.34	0.34	1.30	7 47 29.5	2.7	18.0	1.7
23	11 0 48.75	0.36	1.29	7 46 23.8	2.8	17.9	1.7
24	11 0 57.78	0.39	1.29	7 45 14.2	3.0	17.9	1.7
25	11 1 7.45	0.42	1.29	7 44 0.6	3.2	17.8	1.7
26	11 1 17.75	0.44	1.29	7 42 43.2	3.3	17.8	1.7
27	11 1 28.67	0.47	1.28	7 41 21.9	3.5	17.7	1.6
28	11 1 40.21	0.49	1.28	7 39 56.8	3.6	17.7	1.6
29	11 1 52.37	0.52	1.27	7 38 27.8	3.8	17.6	1.6
30	11 2 5.14	0.54	1.27	7 36 55.1	3.9	17.6	1.6
31	11 2 18.51	0.57	1.26	7 35 18.7	4.1	17.5	1.6
32	11 2 32.50	+ 0.60	1.26	N. 7 33 38.5	— 4.3	17.4	1.6

JUNE, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad
	Noon.	Noon.	Noon.		Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 2 28.71	N. 7 34 5.5	0.7232999	6 23.1	174 34 16.3	N. 1 16 15.3	0.72
2	11 2 43.17	7 32 22.3	.7245839	6 19.4	174 38 49.7	1 16 16.8	.72
3	11 2 58.23	7 30 35.5	.7258690	6 15.7	174 43 23.1	1 16 18.4	.72
4	11 3 13.88	7 28 44.9	.7271489	6 12.0	174 47 56.5	1 16 19.9	.72
5	11 3 30.12	7 26 50.7	.7284254	6 8.4	174 52 29.8	1 16 21.4	.72
6	11 3 46.95	7 24 52.9	.7296980	6 4.7	174 57 3.2	1 16 22.9	.72
7	11 4 4.35	7 22 51.5	.7309666	6 1.1	175 1 36.6	1 16 24.4	.72
8	11 4 22.33	7 20 46.5	.7322308	5 57.4	175 6 9.9	1 16 25.9	.72
9	11 4 40.89	7 18 38.0	.7334903	5 53.8	175 10 43.2	1 16 27.4	.72
10	11 5 0.00	7 16 26.0	.7347448	5 50.2	175 15 16.6	1 16 28.8	.72
11	11 5 19.68	7 14 10.6	.7359941	5 46.6	175 19 49.9	1 16 30.3	.72
12	11 5 39.91	7 11 51.7	.7372379	5 43.0	175 24 23.2	1 16 31.8	.72
13	11 6 0.68	7 9 29.5	.7384759	5 39.4	175 28 56.5	1 16 33.2	.72
14	11 6 21.99	7 7 3.9	.7397079	5 35.8	175 33 29.8	1 16 34.7	.72
15	11 6 43.84	7 4 35.0	.7409336	5 32.3	175 38 3.0	1 16 36.1	.72
16	11 7 6.21	7 2 2.8	.7421528	5 28.7	175 42 36.3	1 16 37.5	.72
17	11 7 29.10	6 59 27.4	.7433652	5 25.2	175 47 9.6	1 16 38.9	.72
18	11 7 52.50	6 56 48.8	.7445706	5 21.6	175 51 42.8	1 16 40.3	.72
19	11 8 16.40	6 54 7.1	.7457689	5 18.1	175 56 16.0	1 16 41.7	.72
20	11 8 40.81	6 51 22.2	.7469599	5 14.6	176 0 49.2	1 16 43.1	.72
21	11 9 5.71	6 48 34.3	.7481433	5 11.0	176 5 22.5	1 16 44.5	.72
22	11 9 31.09	6 45 43.3	.7493191	5 7.5	176 9 55.7	1 16 45.9	.72
23	11 9 56.96	6 42 49.3	.7504870	5 4.0	176 14 28.9	1 16 47.3	.72
24	11 10 23.29	6 39 52.3	.7516470	5 0.5	176 19 2.1	1 16 48.6	.72
25	11 10 50.10	6 36 52.4	.7527988	4 57.0	176 23 35.3	1 16 50.0	.72
26	11 11 17.37	6 33 49.6	.7539423	4 53.6	176 28 8.4	1 16 51.3	.72
27	11 11 45.10	6 30 43.9	.7550774	4 50.1	176 32 41.6	1 16 52.7	.72
28	11 12 13.27	6 27 35.4	.7562038	4 46.6	176 37 14.8	1 16 54.0	.72
29	11 12 41.89	6 24 24.1	.7573215	4 43.2	176 41 47.9	1 16 55.3	.72
30	11 13 10.94	6 21 10.0	.7584303	4 39.7	176 46 21.0	1 16 56.6	.72
31	11 13 40.44	N. 6 17 53.1	0.7595301	4 36.3	176 50 54.2	N. 1 16 57.9	0.72



JUNE, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<i>h m s</i>	<i>s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>	<i>"</i>
1 2 32.50	+ 0.60	1.26	N. 7 33 38.5	- 4.3	17.4	1.6
1 2 47.08	0.62	1.26	7 31 54.6	4.4	17.4	1.6
1 3 2.25	0.64	1.25	7 30 7.0	4.6	17.3	1.6
1 3 18.02	0.67	1.25	7 28 15.8	4.7	17.3	1.6
1 3 34.37	0.69	1.25	7 26 20.9	4.9	17.2	1.6
1 3 51.30	0.71	1.25	7 24 22.5	5.0	17.2	1.6
1 4 8.81	0.74	1.24	7 22 20.5	5.2	17.2	1.6
1 4 26.89	0.77	1.24	7 20 14.9	5.3	17.2	1.6
1 4 45.53	0.79	1.23	7 18 5.9	5.4	17.1	1.6
1 5 4.74	0.81	1.23	7 15 53.4	5.6	17.1	1.6
1 5 24.50	0.83	1.22	7 13 37.4	5.7	17.0	1.6
1 5 44.81	0.86	1.22	7 11 18.1	5.9	17.0	1.6
1 6 5.66	0.88	1.22	7 8 55.4	6.0	17.0	1.6
1 6 27.04	0.90	1.21	7 6 29.4	6.2	16.8	1.6
1 6 48.95	0.92	1.21	7 4 0.1	6.3	16.8	1.6
1 7 11.39	0.95	1.21	7 1 27.6	6.4	16.7	1.6
1 7 34.34	0.97	1.21	6 58 51.9	6.6	16.7	1.5
1 7 57.79	0.99	1.20	6 56 13.0	6.7	16.6	1.5
1 8 21.75	1.01	1.20	6 53 31.0	6.8	16.6	1.5
1 8 46.21	1.03	1.19	6 50 45.8	6.9	16.5	1.5
1 9 11.15	1.05	1.19	6 47 57.6	7.1	16.5	1.5
1 9 36.57	1.07	1.19	6 45 6.4	7.2	16.5	1.5
1 10 2.48	1.09	1.18	6 42 12.2	7.3	16.4	1.5
1 10 28.85	1.11	1.18	6 39 15.0	7.4	16.4	1.5
1 10 55.69	1.13	1.18	6 36 15.0	7.6	16.3	1.5
1 11 22.99	1.15	1.18	6 33 12.0	7.7	16.3	1.5
1 11 50.74	1.17	1.17	6 30 6.2	7.8	16.2	1.5
1 12 18.93	1.18	1.17	6 26 57.5	7.9	16.2	1.5
1 12 47.57	1.20	1.17	6 23 46.1	8.0	16.1	1.5
1 13 16.64	1.22	1.17	6 20 31.9	8.2	16.1	1.5
1 13 46.15	+ 1.24	1.16	N. 6 17 15.0	- 8.3	16.0	1.5

JULY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	L Rac
	Noon.	Noon.	Noon.		Noon.	Noon.	
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 13 40.44	N. 6 17 53.1	0.7595301	4 36.3	176 50 54.2	N. 1 16 57.9	0.73
2	11 14 10.36	6 14 33.5	.7606207	4 32.9	176 55 27.3	1 16 59.2	.73
3	11 14 40.71	6 11 11.3	.7617019	4 29.4	177 0 0.4	1 17 0.5	.73
4	11 15 11.48	6 7 46.4	.7627736	4 26.0	177 4 33.5	1 17 1.8	.73
5	11 15 42.67	6 4 18.9	.7638357	4 22.6	177 9 6.6	1 17 3.1	.73
6	11 16 14.27	6 0 48.8	.7648879	4 19.2	177 13 39.6	1 17 4.3	.73
7	11 16 46.27	5 57 16.1	.7659301	4 15.8	177 18 12.7	1 17 5.6	.73
8	11 17 18.67	5 53 40.9	.7669622	4 12.4	177 22 45.8	1 17 6.9	.73
9	11 17 51.46	5 50 3.2	.7679841	4 9.0	177 27 18.8	1 17 8.1	.73
10	11 18 24.63	5 46 23.1	.7689955	4 5.6	177 31 51.9	1 17 9.3	.73
11	11 18 58.18	5 42 40.5	.7699963	4 2.2	177 36 24.9	1 17 10.6	.73
12	11 19 32.09	5 38 55.6	.7709865	3 58.9	177 40 57.9	1 17 11.8	.73
13	11 20 6.37	5 35 8.4	.7719658	3 55.5	177 45 30.9	1 17 13.0	.73
14	11 20 41.01	5 31 18.8	.7729342	3 52.2	177 50 3.9	1 17 14.2	.73
15	11 21 16.00	5 27 27.0	.7738916	3 48.8	177 54 36.9	1 17 15.4	.73
16	11 21 51.34	5 23 32.9	.7748378	3 45.5	177 59 9.9	1 17 16.6	.73
17	11 22 27.02	5 19 36.6	.7757728	3 42.2	178 3 42.9	1 17 17.7	.73
18	11 23 3.04	5 15 38.2	.7766964	3 38.8	178 8 15.8	1 17 18.9	.73
19	11 23 39.39	5 11 37.7	.7776087	3 35.5	178 12 48.8	1 17 20.1	.73
20	11 24 16.06	5 7 35.1	.7785096	3 32.2	178 17 21.7	1 17 21.2	.73
21	11 24 53.05	5 3 30.4	.7793989	3 28.8	178 21 54.7	1 17 22.4	.73
22	11 25 30.36	4 59 23.7	.7802767	3 25.5	178 26 27.6	1 17 23.5	.73
23	11 26 7.97	4 55 15.0	.7811428	3 22.2	178 31 0.5	1 17 24.6	.73
24	11 26 45.89	4 51 4.4	.7819973	3 18.9	178 35 33.4	1 17 25.8	.73
25	11 27 24.10	4 46 51.8	.7828400	3 15.6	178 40 6.3	1 17 26.9	.73
26	11 28 2.61	4 42 37.3	.7836708	3 12.3	178 44 39.2	1 17 28.0	.73
27	11 28 41.40	4 38 21.0	.7844898	3 9.0	178 49 12.0	1 17 29.1	.73
28	11 29 20.48	4 34 2.9	.7852968	3 5.7	178 53 44.9	1 17 30.2	.73
29	11 29 59.84	4 29 42.9	.7860918	3 2.5	178 58 17.8	1 17 31.2	.73
30	11 30 39.46	4 25 21.2	.7868748	2 59.2	179 2 50.6	1 17 32.3	.73
31	11 31 19.36	4 20 57.8	.7876455	2 55.9	179 7 23.4	1 17 33.4	.73
32	11 31 59.53	N. 4 16 32.6	0.7884040	2 52.7	179 11 56.3	N. 1 17 34.4	0.73



JULY, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
1	<sup>h</sup> 11 <sup>m</sup> 13 <sup>s</sup> 46·15	+ 1·24	1·16	N. 6° 17' 15·0	— 8·3	16·0	1·5
2	11 14 16·08	1·26	1·16	6 13 55·4	8·4	16·0	1·5
3	11 14 46·44	1·27	1·16	6 10 33·2	8·5	16·0	1·5
4	11 15 17·21	1·29	1·15	6 7 8·3	8·6	15·9	1·5
5	11 15 48·40	1·31	1·15	6 3 40·8	8·7	15·9	1·5
6	11 16 20·00	1·33	1·14	6 0 10·7	8·8	15·9	1·5
7	11 16 52·00	1·34	1·14	5 56 38·0	8·9	15·9	1·5
8	11 17 24·39	1·36	1·14	5 53 2·9	9·0	15·8	1·5
9	11 17 57·17	1·37	1·14	5 49 25·3	9·1	15·8	1·5
10	11 18 30·33	1·39	1·14	5 45 45·3	9·2	15·8	1·5
11	11 19 3·86	1·41	1·13	5 42 2·9	9·3	15·7	1·5
12	11 19 37·75	1·42	1·13	5 38 18·1	9·4	15·7	1·5
13	11 20 12·01	1·44	1·13	5 34 31·0	9·5	15·7	1·4
14	11 20 46·63	1·45	1·13	5 30 41·6	9·6	15·6	1·4
15	11 21 21·59	1·46	1·12	5 26 49·9	9·7	15·6	1·4
16	11 21 56·90	1·48	1·12	5 22 56·1	9·8	15·5	1·4
17	11 22 32·56	1·49	1·11	5 19 0·0	9·9	15·5	1·4
18	11 23 8·55	1·51	1·11	5 15 1·8	10·0	15·5	1·4
19	11 23 44·86	1·52	1·11	5 11 1·5	10·1	15·4	1·4
20	11 24 21·49	1·53	1·11	5 6 59·2	10·1	15·4	1·4
21	11 24 58·44	1·55	1·11	5 2 54·8	10·2	15·4	1·4
22	11 25 35·71	1·56	1·10	4 58 48·3	10·3	15·3	1·4
23	11 26 13·28	1·57	1·10	4 54 39·9	10·4	15·3	1·4
24	11 26 51·15	1·58	1·10	4 50 29·6	10·5	15·3	1·4
25	11 27 29·32	1·60	1·10	7·4	10·6	15·2	1·4
26	11 28 7·77	1·61	1·10	3·3	10·6	15·2	1·4
27	11 28 46·52	1·62	1·10	7·3	10·7	15·2	1·4
28	11 29 25·54	1·63	1·10	3	10·8	15·2	1·4
29	11 30 4·84	1·64	1		10·9	15·2	1·4
30	11 30 44·41	1·65	1		10·9	15·2	1·4
31	11 31 24·26	1·67	1		11·0	15·2	1·4
2	11 32 4·36	+ 1·68	1		— 11·1	15·2	1·4

AUGUST, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	11 31 59.53	N. 4 16 32.6	0.7884040	2 52.7	179 11 56.3	N. 1 17 34.4	0.736
2	11 32 39.95	4 12 5.8	.7891501	2 49.4	179 16 29.1	1 17 35.5	.736
3	11 33 20.63	4 7 37.3	.7898838	2 46.1	179 21 1.9	1 17 36.5	.736
4	11 34 1.56	4 3 7.2	.7906050	2 42.9	179 25 34.7	1 17 37.5	.736
5	11 34 42.74	3 58 35.6	.7913136	2 39.6	179 30 7.5	1 17 38.6	.736
6	11 35 24.16	3 54 2.4	.7920095	2 36.4	179 34 40.3	1 17 39.6	.736
7	11 36 5.82	3 49 27.6	.7926927	2 33.2	179 39 13.1	1 17 40.6	.736
8	11 36 47.71	3 44 51.4	.7933630	2 29.9	179 43 45.8	1 17 41.6	.736
9	11 37 29.82	3 40 13.7	.7940204	2 26.7	179 48 18.6	1 17 42.6	.736
10	11 38 12.16	3 35 34.5	.7946648	2 23.5	179 52 51.3	1 17 43.5	.736
11	11 38 54.71	3 30 54.0	.7952961	2 20.2	179 57 24.1	1 17 44.5	.736
12	11 39 37.47	3 26 12.1	.7959143	2 17.0	180 1 56.8	1 17 45.5	.736
13	11 40 20.44	3 21 28.9	.7965195	2 13.8	180 6 29.5	1 17 46.4	.736
14	11 41 3.61	3 16 44.4	.7971114	2 10.6	180 11 2.2	1 17 47.4	.736
15	11 41 46.97	3 11 58.7	.7976902	2 7.4	180 15 35.0	1 17 48.3	.736
16	11 42 30.52	3 7 11.8	.7982557	2 4.2	180 20 7.7	1 17 49.3	.736
17	11 43 14.25	3 2 23.8	.7988080	2 0.9	180 24 40.3	1 17 50.2	.736
18	11 43 58.17	2 57 34.6	.7993471	1 57.7	180 29 13.0	1 17 51.1	.736
19	11 44 42.25	2 52 44.3	.7998728	1 54.5	180 33 45.7	1 17 52.0	.736
20	11 45 26.51	2 47 53.0	.8003853	1 51.3	180 38 18.4	1 17 52.9	.736
21	11 46 10.94	2 43 0.6	.8008844	1 48.1	180 42 51.0	1 17 53.8	.736
22	11 46 55.53	2 38 7.2	.8013703	1 45.0	180 47 23.6	1 17 54.7	.736
23	11 47 40.27	2 33 12.8	.8018427	1 41.8	180 51 56.3	1 17 55.6	.736
24	11 48 25.17	2 28 17.4	.8023018	1 38.6	180 56 28.9	1 17 56.4	.736
25	11 49 10.23	2 23 21.1	.8027475	1 35.4	181 1 1.5	1 17 57.3	.736
26	11 49 55.43	2 18 24.0	.8031797	1 32.2	181 5 34.1	1 17 58.1	.736
27	11 50 40.77	2 13 25.9	.8035983	1 29.0	181 10 6.7	1 17 59.0	.736
28	11 51 26.26	2 8 27.0	.8040034	1 25.9	181 14 39.3	1 17 59.8	.736
29	11 52 11.88	2 3 27.3	.8043949	1 22.7	181 19 11.9	1 18 0.6	.736
30	11 52 57.64	1 58 26.8	.8047727	1 19.5	181 23 44.5	1 18 1.4	.736
31	11 53 43.52	1 53 25.5	.8051369	1 16.3	181 28 17.1	1 18 2.2	.736
32	11 54 29.53	N. 1 48 23.6	0.8054872	1 13.2	181 32 49.6	N. 1 18 3.0	0.736



## AUGUST, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
11 32 4 36	+ 1 68	1 08	N. 4 16 0 7	- 11 1	15 0	1 4
11 32 44 72	1 69	1 08	4 11 34 3	11 1	15 0	1 4
11 33 25 34	1 70	1 08	4 7 6 2	11 2	15 0	1 4
11 34 6 21	1 71	1 07	4 2 36 6	11 3	14 9	1 4
11 34 47 32	1 72	1 07	3 58 5 4	11 3	14 9	1 4
11 35 28 67	1 73	1 07	3 53 32 6	11 4	14 9	1 4
11 36 10 26	1 74	1 07	3 48 58 3	11 5	14 9	1 4
11 36 52 08	1 75	1 06	3 44 22 6	11 5	14 8	1 4
11 37 34 12	1 76	1 06	3 39 45 3	11 6	14 8	1 4
11 38 16 39	1 77	1 06	3 35 6 7	11 6	14 8	1 4
11 38 58 87	1 77	1 06	3 30 26 6	11 7	14 8	1 4
11 39 41 55	1 78	1 06	3 25 45 2	11 8	14 8	1 4
11 40 24 44	1 79	1 06	3 21 2 5	11 8	14 7	1 4
11 41 7 53	1 80	1 06	3 16 18 6	11 9	14 7	1 4
11 41 50 81	1 81	1 06	3 11 33 4	11 9	14 7	1 4
11 42 34 28	1 82	1 06	3 6 47 0	12 0	14 7	1 4
11 43 17 93	1 82	1 06	3 1 59 5	12 0	14 7	1 4
11 44 1 76	1 83	1 06	2 57 10 9	12 0	14 7	1 4
11 44 45 77	1 84	1 06	2 52 21 2	12 1	14 7	1 4
11 45 29 94	1 84	1 06	2 47 30 4	12 1	14 7	1 4
11 46 14 28	1 85	1 06	2 42 38 6	12 2	14 7	1 4
11 46 58 78	1 86	1 05	2 37 45 8	12 2	14 6	1 4
11 47 43 44	1 86	1 05	2 32 52 0	12 3	14 6	1 4
11 48 28 25	1 87	1 05	2 27 57 2	12 3	14 6	1 4
11 49 13 22	1 88	1 05	2 23 1 5	12 3	14 6	1 4
11 49 58 33	1 88	1 05	2 18 4 9	12 4	14 6	1 3
11 50 43 58	1 89	1 05	2 13 7 5	12 4	14 6	1 3
11 51 28 97	1 89	1 05	2 8 9 2	12 5	14 6	1 3
11 52 14 50	1 90	1 04	2 3 10 1	12 5	14 5	1 3
11 53 0 17	1 90	1 04	1 58 10 2	12 5	14 5	1
11 53 45 96	1 91	1 04	1 53 9 5	12 5	14 5	'
11 54 31 87	+ 1 92	1 04	N. 1 48 8 2	- 12 6	14 5	

## SEPTEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No
1	<sup>h m s</sup> 11 54 29.53	<sup>° ′ ″</sup> N.1 48 23.6	0.8054872	<sup>h m</sup> 1 13.2	<sup>° ′ ″</sup> 181 32 49.6	<sup>° ′ ″</sup> N.1 18 3.0	0.736
2	11 55 15.66	1 43 20.9	.8058238	1 10.0	181 37 22.2	1 18 3.8	.736
3	11 56 1.91	1 38 17.6	.8061465	1 6.8	181 41 54.8	1 18 4.6	.736
4	11 56 48.26	1 33 13.7	.8064553	1 3.7	181 46 27.3	1 18 5.4	.736
5	11 57 34.72	1 28 9.2	.8067502	1 0.5	181 50 59.9	1 18 6.1	.736
6	11 58 21.29	1 23 4.1	.8070310	0 57.3	181 55 32.4	1 18 6.9	.736
7	11 59 7.95	1 17 58.5	.8072979	0 54.2	182 0 4.9	1 18 7.6	.736
8	11 59 54.70	1 12 52.4	.8075507	0 51.0	182 4 37.4	1 18 8.4	.736
9	12 0 41.54	1 7 45.9	.8077894	0 47.9	182 9 10.0	1 18 9.1	.736
10	12 1 28.46	1 2 38.9	.8080139	0 44.7	182 13 42.5	1 18 9.8	.736
11	12 2 15.46	0 57 31.6	.8082244	0 41.6	182 18 15.0	1 18 10.5	.736
12	12 3 2.53	0 52 24.0	.8084207	0 38.4	182 22 47.5	1 18 11.3	.736
13	12 3 49.67	0 47 16.0	.8086029	0 35.3	182 27 20.0	1 18 12.0	.736
14	12 4 36.87	0 42 7.8	.8087710	0 32.1	182 31 52.4	1 18 12.6	.736
15	12 5 24.13	0 36 59.4	.8089249	0 29.0	182 36 24.9	1 18 13.3	.736
16	12 6 11.45	0 31 50.7	.8090648	0 25.8	182 40 57.4	1 18 14.0	.736
17	12 6 58.81	0 26 41.9	.8091903	0 22.7	182 45 29.9	1 18 14.7	.736
18	12 7 46.23	0 21 32.9	.8093020	0 19.5	182 50 2.3	1 18 15.3	.736
19	12 8 33.68	0 16 23.9	.8093995	0 16.4	182 54 34.8	1 18 16.0	.736
20	12 9 21.18	0 11 14.7	.8094828	0 13.2	182 59 7.2	1 18 16.6	.736
21	12 10 8.71	0 6 5.5	.8095520	0 10.1	183 3 39.6	1 18 17.2	.736
22	12 10 56.28	N.0 0 56.3	.8096071	0 7.0	183 8 12.1	1 18 17.9	.736
23	12 11 43.87	S.0 4 13.0	.8096480	0 3.8	183 12 44.5	1 18 18.5	.736
24	12 12 31.49	0 9 22.2	.8096747	$\left\{ \begin{smallmatrix} 0 \\ 57.5 \end{smallmatrix} \right\}$	183 17 16.9	1 18 19.1	.736
25	12 13 19.13	0 14 31.3	.8096872	23 54.4	183 21 49.4	1 18 19.7	.736
26	12 14 6.79	0 19 40.3	.8096854	23 51.3	183 26 21.8	1 18 20.3	.736
27	12 14 54.46	0 24 49.2	.8096694	23 48.1	183 30 54.2	1 18 20.8	.736
28	12 15 42.15	0 29 57.9	.8096391	23 45.0	183 35 26.6	1 18 21.4	.736
29	12 16 29.84	0 35 6.4	.8095945	23 41.8	183 39 59.0	1 18 22.0	.736
30	12 17 17.53	0 40 14.7	.8095355	23 38.7	183 44 31.4	1 18 22.5	.736
31	12 18 5.21	S.0 45 22.8	0.8094621	23 35.5	183 49 3.8	N.1 18 23.1	0.736



## SEPTEMBER, 1850.

At Transit over the Meridian of Greenwich.

Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup>	<sup>°</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
11 54 31·87	+ 1·92	1·04	N. 1 48 8·2	- 12·6	14·5	1·3
11 55 17·91	1·92	1·04	1 43 6·2	12·6	14·5	1·3
11 56 4·05	1·93	1·04	1 38 3·5	12·6	14·5	1·3
11 56 50·31	1·93	1·04	1 33 0·2	12·7	14·5	1·3
11 57 36·67	1·93	1·04	1 27 56·3	12·7	14·5	1·3
11 58 23·14	1·94	1·03	1 22 51·9	12·7	14·4	1·3
11 59 9·71	1·94	1·03	1 17 47·0	12·7	14·4	1·3
11 59 56·36	1·95	1·03	1 12 41·5	12·7	14·4	1·3
12 0 43·10	1·95	1·03	1 7 35·7	12·8	14·4	1·3
12 1 29·92	1·95	1·03	1 2 29·4	12·8	14·4	1·3
12 2 16·82	1·96	1·03	0 57 22·7	12·8	14·4	1·3
12 3 3·79	1·96	1·03	0 52 15·8	12·8	14·4	1·3
12 3 50·82	1·96	1·03	0 47 8·5	12·8	14·4	1·3
12 4 37·92	1·96	1·03	0 42 0·9	12·8	14·4	1·3
12 5 25·08	1·96	1·03	0 36 53·1	12·8	14·4	1·3
12 6 12·29	1·97	1·03	0 31 45·2	12·8	14·4	1·3
12 6 59·56	1·97	1·03	0 26 37·0	12·8	14·4	1·3
12 7 46·87	1·97	1·03	0 21 28·7	12·8	14·4	1·3
12 8 34·22	1·97	1·03	0 16 20·3	12·9	14·4	1·3
12 9 21·62	1·98	1·03	0 11 11·9	12·9	14·4	1·3
12 10 9·05	1·98	1·03	0 6 3·3	12·9	14·4	1·3
12 10 56·51	1·98	1·03	N. 0 0 54·8	12·9	14·4	1·3
12 11 44·00	1·98	1·03	S. 0 4 13·8	12·9	14·4	1·3
$\left\{ \begin{smallmatrix} 12 & 12 & 31 & 51 \\ 12 & 12 & 19 & 03 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 1 & 98 \\ 1 & 99 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 1 & 03 \\ 1 & 02 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 0 & 9 & 22 & 3 \\ 0 & 14 & 20 & 7 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 12 & 9 \\ 12 & 9 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 14 & 4 \\ 14 & 4 \end{smallmatrix} \right\}$	$\left\{ \begin{smallmatrix} 1 & 3 \\ 1 & 3 \end{smallmatrix} \right\}$
12 14 6·60	1·98	1·03	0 19 39·1	12·8	14	
12 14 54·17	1·98	1·03	0 24 47·3	12·8	1	
12 15 41·75	1·98	1·03	0 29 55·4	12·8	1	
12 16 29·34	1·98	1·03	0 35 3·2	12·8		
12 17 16·92	1·98	1·03	0 40 10·8	12·8		
12 18 4·51	1·98	1·03	0 45 18·2	12·8		
12 18 52·08	+ 1·98	1·03	S. 0 50 25·3	- 12·8		

OCTOBER, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	12 18 52.21	S. 0 45 22.8	0.8094621	23 35.5	183 49 3.8	N. 1 18 23.1	0.736
2	12 18 52.89	0 50 30.5	.8093742	23 32.4	183 53 36.2	1 18 23.6	.736
3	12 19 40.56	0 55 37.9	.8092718	23 29.3	183 58 8.6	1 18 24.1	.736
4	12 20 28.21	1 0 44.9	.8091550	23 26.1	184 2 41.0	1 18 24.7	.736
5	12 21 15.84	1 5 51.6	.8090236	23 23.0	184 7 13.3	1 18 25.2	.736
6	12 22 3.43	1 10 57.8	.8088778	23 19.8	184 11 45.7	1 18 25.7	.736
7	12 22 51.00	1 16 3.5	.8087175	23 16.7	184 16 18.1	1 18 26.2	.736
8	12 23 38.53	1 21 8.7	.8085426	23 13.5	184 20 50.4	1 18 26.7	.736
9	12 24 26.01	1 26 13.4	.8083532	23 10.4	184 25 22.8	1 18 27.1	.736
10	12 25 13.45	1 31 17.5	.8081494	23 7.3	184 29 55.2	1 18 27.6	.736
11	12 26 0.83	1 36 20.9	.8079311	23 4.1	184 34 27.5	1 18 28.1	.736
12	12 26 48.16	1 41 23.7	.8076983	23 1.0	184 38 59.9	1 18 28.5	.736
13	12 27 35.42	1 46 25.8	.8074512	22 57.8	184 43 32.2	1 18 29.0	.736
14	12 28 22.61	1 51 27.2	.8071896	22 54.7	184 48 4.5	1 18 29.4	.736
15	12 29 9.73	1 56 27.8	.8069137	22 51.5	184 52 36.9	1 18 29.9	.736
16	12 29 56.78	2 1 27.6	.8066234	22 48.4	184 57 9.2	1 18 30.3	.736
17	12 30 43.75	2 6 26.5	.8063187	22 45.2	185 1 41.5	1 18 30.7	.736
18	12 31 30.63	2 11 24.6	.8059998	22 42.1	185 6 13.9	1 18 31.1	.736
19	12 32 17.43	2 16 21.7	.8056665	22 38.9	185 10 46.2	1 18 31.5	.736
20	12 33 4.13	2 21 18.0	.8053190	22 35.7	185 15 18.5	1 18 31.9	.736
21	12 33 50.74	2 26 13.3	.8049572	22 32.6	185 19 50.8	1 18 32.3	.736
22	12 34 37.24	2 31 7.6	.8045812	22 29.4	185 24 23.1	1 18 32.7	.736
23	12 35 23.64	2 36 0.9	.8041909	22 26.2	185 28 55.4	1 18 33.0	.736
24	12 36 9.93	2 40 53.2	.8037863	22 23.1	185 33 27.7	1 18 33.4	.736
25	12 36 56.10	2 45 44.4	.8033674	22 19.9	185 38 0.0	1 18 33.8	.736
26	12 37 42.16	2 50 34.4	.8029342	22 16.7	185 42 32.3	1 18 34.1	.736
27	12 38 28.09	2 55 23.3	.8024867	22 13.6	185 47 4.6	1 18 34.4	.736
28	12 39 13.90	3 0 11.0	.8020249	22 10.4	185 51 36.9	1 18 34.8	.736
29	12 39 59.57	3 4 57.5	.8015488	22 7.2	185 56 9.2	1 18 35.1	.736
30	12 40 45.10	3 9 42.7	.8010584	22 4.0	186 0 41.5	1 18 35.4	.736
31	12 41 30.48	3 14 26.6	.8005536	22 0.9	186 5 13.8	1 18 35.7	.736
32	12 42 15.71	S. 3 19 9.2	0.8000346	21 57.7	186 9 46.1	N. 1 18 36.0	0.736



## OCTOBER, 1850.

At Transit over the Meridian of Greenwich.

	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
	12 18 52.08	+ 1.98	1.03	S. 0 50 25.3	-12.8	14.4	1.3
	12 19 39.64	1.98	1.03	0 55 32.0	12.8	14.4	1.3
	12 20 27.19	1.98	1.03	1 0 38.4	12.8	14.4	1.3
	12 21 14.71	1.98	1.03	1 5 44.4	12.7	14.4	1.3
	12 22 2.21	1.98	1.03	1 10 49.9	12.7	14.4	1.3
	12 22 49.68	1.98	1.03	1 15 55.0	12.7	14.4	1.3
	12 23 37.10	1.98	1.03	1 20 59.5	12.7	14.4	1.3
	12 24 24.48	1.98	1.03	1 26 3.6	12.7	14.4	1.3
	12 25 11.82	1.97	1.03	1 31 7.0	12.6	14.4	1.3
	12 25 59.10	1.97	1.03	1 36 9.8	12.6	14.4	1.3
	12 26 46.32	1.97	1.03	1 41 12.0	12.6	14.4	1.3
	12 27 33.48	1.96	1.03	1 46 13.5	12.5	14.4	1.3
13	12 28 20.57	1.96	1.03	1 51 14.2	12.5	14.4	1.3
14	12 29 7.60	1.96	1.04	1 56 14.2	12.5	14.5	1.3
15	12 29 54.55	1.95	1.04	2 1 13.3	12.4	14.5	1.3
16	12 30 41.42	1.95	1.04	2 6 11.6	12.4	14.5	1.3
17	12 31 28.20	1.95	1.04	2 11 9.1	12.4	14.5	1.3
18	12 32 14.90	1.94	1.04	2 16 5.7	12.3	14.5	1.3
19	12 33 1.50	1.94	1.04	2 21 1.3	12.3	14.5	1.3
20	12 33 48.01	1.94	1.04	2 25 56.0	12.3	14.5	1.3
21	12 34 34.42	1.93	1.04	2 30 49.8	12.2	14.5	1.3
22	12 35 20.72	1.93	1.04	2 35 42.5		14.5	1.3
23	12 36 6.92	1.92	1.05	2 40 34.2		14.6	1.3
24	12 36 53.00	1.92	1.05	2 45 24.8		14.6	1.3
25	12 37 38.96	1.91	1.05	2 50		14.6	1.4
26	12 38 24.80	1.91	1.05	2 53		14.6	1.4
27	12 39 10.52	1.90	1.05	2 58		14.6	1.4
28	12 39 56.10	1.90	1.05	3		14.4	
29	12 40 41.53	1.89	1.05	3		14	
30	12 41 26.83	1.88	1.05	3		14	
31	12 42 11.97	1.88	1.05	3		14	
32	12 42 56.96	+ 1.87	1.05	S. 3		14	

## NOVEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<i>h m s</i>	<i>° ′ ″</i>		<i>h m</i>	<i>° ′ ″</i>	<i>° ′ ″</i>	
1	12 42 15.71	S. 3 19 9.2	0.8000346	21 57.7	186 9 46.1	N. 1 18 36.0	0.7365451
2	12 43 0.78	3 23 50.4	.7995012	21 54.5	186 14 18.4	1 18 36.3	.7365479
3	12 43 45.69	3 28 30.3	.7989536	21 51.3	186 18 50.7	1 18 36.6	.7365506
4	12 44 30.43	3 33 8.6	.7983918	21 48.1	186 23 23.0	1 18 36.9	.7365533
5	12 45 15.00	3 37 45.5	.7978158	21 44.9	186 27 55.3	1 18 37.1	.7365560
6	12 45 59.38	3 42 20.8	.7972256	21 41.7	186 32 27.6	1 18 37.4	.7365586
7	12 46 43.58	3 46 54.6	.7966214	21 38.5	186 36 59.8	1 18 37.6	.7365612
8	12 47 27.58	3 51 26.7	.7960031	21 35.3	186 41 32.1	1 18 37.9	.7365637
9	12 48 11.39	3 55 57.2	.7953709	21 32.1	186 46 4.4	1 18 38.1	.7365662
10	12 48 54.99	4 0 26.0	.7947248	21 28.8	186 50 36.6	1 18 38.3	.7365687
11	12 49 38.38	4 4 53.1	.7940649	21 25.6	186 55 8.9	1 18 38.6	.7365712
12	12 50 21.55	4 9 18.4	.7933911	21 22.4	186 59 41.2	1 18 38.8	.7365736
13	12 51 4.50	4 13 41.9	.7927037	21 19.2	187 4 13.4	1 18 39.0	.7365759
14	12 51 47.22	4 18 3.6	.7920027	21 16.0	187 8 45.7	1 18 39.2	.7365782
15	12 52 29.72	4 22 23.4	.7912881	21 12.7	187 13 18.0	1 18 39.3	.7365805
16	12 53 11.97	4 26 41.4	.7905599	21 9.5	187 17 50.2	1 18 39.5	.7365828
17	12 53 53.98	4 30 57.4	.7898183	21 6.3	187 22 22.5	1 18 39.7	.7365850
18	12 54 35.75	4 35 11.5	.7890633	21 3.0	187 26 54.7	1 18 39.8	.7365871
19	12 55 17.26	4 39 23.6	.7882949	20 59.8	187 31 27.0	1 18 40.0	.7365893
20	12 55 58.52	4 43 33.7	.7875132	20 56.5	187 35 59.3	1 18 40.1	.7365914
21	12 56 39.51	4 47 41.7	.7867183	20 53.3	187 40 31.5	1 18 40.3	.7365934
22	12 57 20.23	4 51 47.7	.7859101	20 50.0	187 45 3.8	1 18 40.4	.7365954
23	12 58 0.68	4 55 51.5	.7850888	20 46.8	187 49 36.1	1 18 40.5	.7365974
24	12 58 40.84	4 59 53.1	.7842543	20 43.5	187 54 8.3	1 18 40.6	.7365994
25	12 59 20.71	5 3 52.6	.7834068	20 40.2	187 58 40.6	1 18 40.7	.7366013
26	13 0 0.29	5 7 49.8	.7825463	20 37.0	188 3 12.8	1 18 40.8	.7366031
27	13 0 39.57	5 11 44.8	.7816728	20 33.7	188 7 45.1	1 18 40.9	.7366050
28	13 1 18.54	5 15 37.5	.7807864	20 30.4	188 12 17.4	1 18 41.0	.7366068
29	13 1 57.19	5 19 27.8	.7798873	20 27.1	188 16 49.6	1 18 41.1	.7366085
30	13 2 35.52	5 23 15.7	.7789754	20 23.8	188 21 21.9	1 18 41.1	.7366102
31	13 3 13.52	S. 5 27 1.2	0.7780509	20 20.5	188 25 54.1	N. 1 18 41.2	0.7366119



## NOVEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	12 42 56.96	+ 1.87	1.05	S. 3 23 26.6	- 11.7	14.7	1.4
2	12 43 41.79	1.86	1.05	3 28 5.9	11.6	14.7	1.4
3	12 44 26.44	1.86	1.06	3 32 43.8	11.6	14.7	1.4
4	12 45 10.93	1.85	1.06	3 37 20.3	11.5	14.7	1.4
5	12 45 55.23	1.84	1.06	3 41 55.1	11.4	14.7	1.4
6	12 46 39.34	1.83	1.06	3 46 28.4	11.4	14.7	1.4
7	12 47 23.27	1.83	1.06	3 51 0.1	11.3	14.7	1.4
8	12 48 7.00	1.82	1.06	3 55 30.1	11.2	14.8	1.4
9	12 48 50.52	1.81	1.06	3 59 58.5	11.1	14.8	1.4
10	12 49 33.83	1.80	1.06	4 4 25.1	11.1	14.8	1.4
11	12 50 16.93	1.79	1.06	4 8 50.0	11.0	14.8	1.4
12	12 50 59.81	1.78	1.07	4 13 13.1	10.9	14.9	1.4
13	12 51 42.46	1.77	1.07	4 17 34.5	10.9	14.9	1.4
14	12 52 24.89	1.76	1.07	4 21 53.9	10.8	14.9	1.4
15	12 53 7.08	1.75	1.07	4 26 11.5	10.7	14.9	1.4
16	12 53 49.02	1.74	1.08	4 30 27.2	10.6	15.0	1.4
17	12 54 30.72	1.73	1.08	4 34 41.0	10.5	15.0	1.4
18	12 55 12.17	1.72	1.08	4 38 52.7	10.4	15.0	1.4
19	12 55 53.37	1.71	1.08	4 43 2.5	10.4	15.0	1.4
20	12 56 34.30	1.70	1.09	4 47 10.3	10.3	15.1	1.4
21	12 57 14.97	1.69	1.09	4 51 15.9	10.2	15.1	1.4
22	12 57 55.36	1.68	1.09	4 55 19.5	10.1	15.1	1.4
23	12 58 35.47	1.67	1.10	4 59 20.9	10.0	15.2	1.4
24	12 59 15.29	1.65	1.10	5 3 20.0	9.9	15.2	1.4
25	12 59 54.82	1.64	1.10	5 7 17.0	9.8	15.2	1.4
26	13 0 34.05	1.63	1.10	5 11 11.8	9.7	15.2	1.4
27	13 1 12.97	1.62	1.10	5 15 4.3	9.6	15.2	1.4
28	13 1 51.58	1.60	1.11	5 18 54.4	9.5	15.2	1.4
29	13 2 29.87	1.59	1.11	5 22 42.2	9.4	15.2	1.4
30	13 3 7.84	1.58	1.11	5 26 27.5	9.3	15.2	1.4
31	13 3 45.47	+ 1.56	1.11	S. 5 30 10.4	9.2	15.2	1.4

## DECEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<i>h m s</i>	<i>° ′ ″</i>		<i>h m</i>	<i>° ′ ″</i>	<i>° ′ ″</i>	
1	13 3 13.52	S. 5 27 1.2	0.7780509	20 20.5	188 25 54.1	N. 1 18 41.2	0.7366119
2	13 3 51.18	5 30 44.2	.7771138	20 17.2	188 30 26.4	1 18 41.2	.7366135
3	13 4 28.50	5 34 24.8	.7761643	20 13.8	188 34 58.6	1 18 41.3	.7366151
4	13 5 5.47	5 38 2.8	.7752026	20 10.5	188 39 30.9	1 18 41.3	.7366167
5	13 5 42.08	5 41 38.2	.7742287	20 7.2	188 44 3.1	1 18 41.3	.7366182
6	13 6 18.33	5 45 11.0	.7732427	20 3.8	188 48 35.4	1 18 41.3	.7366197
7	13 6 54.20	5 48 41.1	.7722449	20 0.5	188 53 7.6	1 18 41.3	.7366211
8	13 7 29.69	5 52 8.5	.7712354	19 57.2	188 57 39.9	1 18 41.3	.7366225
9	13 8 4.79	5 55 33.2	.7702143	19 53.8	189 2 12.1	1 18 41.3	.7366239
10	13 8 39.50	5 58 55.0	.7691817	19 50.4	189 6 44.4	1 18 41.3	.7366252
11	13 9 13.81	6 2 14.1	.7681379	19 47.1	189 11 16.6	1 18 41.2	.7366265
12	13 9 47.72	6 5 30.3	.7670830	19 43.7	189 15 48.8	1 18 41.2	.7366278
13	13 10 21.21	6 8 43.7	.7660170	19 40.3	189 20 21.1	1 18 41.2	.7366290
14	13 10 54.28	6 11 54.2	.7649403	19 36.9	189 24 53.3	1 18 41.1	.7366302
15	13 11 26.93	6 15 1.7	.7638529	19 33.5	189 29 25.6	1 18 41.0	.7366313
16	13 11 59.14	6 18 6.2	.7627550	19 30.1	189 33 57.8	1 18 41.0	.7366324
17	13 12 30.92	6 21 7.8	.7616467	19 26.7	189 38 30.0	1 18 40.9	.7366335
18	13 13 2.26	6 24 6.3	.7605282	19 23.3	189 43 2.3	1 18 40.8	.7366345
19	13 13 33.14	6 27 1.8	.7593996	19 19.9	189 47 34.5	1 18 40.7	.7366355
20	13 14 3.57	6 29 54.2	.7582610	19 16.4	189 52 6.7	1 18 40.6	.7366365
21	13 14 33.55	6 32 43.5	.7571127	19 13.0	189 56 39.0	1 18 40.5	.7366374
22	13 15 3.05	6 35 29.6	.7559547	19 9.5	190 1 11.2	1 18 40.4	.7366382
23	13 15 32.07	6 38 12.5	.7547873	19 6.1	190 5 43.4	1 18 40.2	.7366391
24	13 16 0.61	6 40 52.2	.7536107	19 2.6	190 10 15.7	1 18 40.1	.7366399
25	13 16 28.65	6 43 28.6	.7524249	18 59.1	190 14 47.9	1 18 39.9	.7366406
26	13 16 56.19	6 46 1.7	.7512302	18 55.7	190 19 20.1	1 18 39.8	.7366413
27	13 17 23.23	6 48 31.6	.7500268	18 52.2	190 23 52.3	1 18 39.6	.7366420
28	13 17 49.75	6 50 58.0	.7488149	18 48.7	190 28 24.6	1 18 39.4	.7366427
29	13 18 15.74	6 53 21.0	.7475948	18 45.2	190 32 56.8	1 18 39.3	.7366433
30	13 18 41.20	6 55 40.6	.7463666	18 41.7	190 37 29.0	1 18 39.1	.7366439
31	13 19 6.13	6 57 56.7	.7451306	18 38.1	190 42 1.2	1 18 38.9	.7366444
32	13 19 30.51	S. 7 0 9.3	0.7438870	18 34.6	190 46 33.5	N. 1 18 38.7	0.7366449



## DECEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	13 3 45.47	+ 1.56	1.11	S. 5 30 10.4	—9.2	15.4	1.4
2	13 4 22.75	1.55	1.12	5 33 50.8	9.1	15.5	1.4
3	13 4 59.69	1.53	1.12	5 37 28.7	9.0	15.5	1.4
4	13 5 36.28	1.52	1.12	5 41 4.0	8.9	15.5	1.4
5	13 6 12.50	1.50	1.12	5 44 36.8	8.8	15.6	1.4
6	13 6 48.35	1.49	1.12	5 48 6.8	8.7	15.6	1.4
7	13 7 23.82	1.47	1.13	5 51 34.2	8.6	15.7	1.5
8	13 7 58.90	1.45	1.13	5 54 58.8	8.5	15.7	1.5
9	13 8 33.60	1.44	1.13	5 58 20.7	8.4	15.7	1.5
10	13 9 7.90	1.42	1.13	6 1 39.8	8.2	15.8	1.5
11	13 9 41.80	1.40	1.13	6 4 56.1	8.1	15.8	1.5
12	13 10 15.28	1.39	1.14	6 8 9.5	8.0	15.9	1.5
13	13 10 48.35	1.37	1.14	6 11 20.0	7.9	15.9	1.5
14	13 11 21.00	1.35	1.15	6 14 27.6	7.8	15.9	1.5
15	13 11 53.22	1.33	1.15	6 17 32.3	7.6	15.9	1.5
16	13 12 25.01	1.31	1.15	6 20 34.0	7.5	15.9	1.5
17	13 12 56.35	1.30	1.16	6 23 32.7	7.4	16.0	1.5
18	13 13 27.24	1.28	1.16	6 26 28.3	7.3	16.0	1.5
19	13 13 57.69	1.26	1.16	6 29 20.9	7.1	16.1	1.5
20	13 14 27.68	1.24	1.16	6 32 10.4	7.0	16.1	1.5
21	13 14 57.21	1.22	1.17	6 34 56.7	6.9	16.2	1.5
22	13 15 26.26	1.20	1.17	6 37 39.9	6.7	16.2	1.5
23	13 15 54.82	1.18	1.17	6 40 19.9	6.6	16.3	1.5
24	13 16 22.90	1.16	1.17	6 42 56.6		16.3	1.5
25	13 16 50.48	1.14	1.18	6 45 30.0		16.4	1.5
26	13 17 17.56	1.12	1.18	6 48 0.0		16.4	1.5
27	13 17 44.12	1.10	1.19	6 50 27.0		16.5	1.5
28	13 18 10.17	1.07	1.19	6 52			
29	13 18 35.68	1.05	1.20	6 55			
30	13 19 0.67	1.03	1.20	6 57			
31	13 19 25.11	1.01	1.20	6 59			
32	13 19 49.00	+ 0.98	1.20	S. 7			

## JANUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vel.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1	h m s 0 10 42.93	S. 1 26 19.0	0.9798186	h m 5 26.8	° ′ ″ 7 47 48.7	S. 2 24 41.4	0.97514
2	0 10 53.65	1 24 54.4	.9805620	5 23.0	7 49 51.6	2 24 42.8	.97511
3	0 11 4.72	1 23 27.5	.9813020	5 19.3	7 51 54.5	2 24 44.1	.97511
4	0 11 16.16	1 21 58.4	.9820384	5 15.5	7 53 57.4	2 24 45.4	.97511
5	0 11 27.95	1 20 27.1	.9827711	5 11.8	7 56 0.3	2 24 46.8	.97501
6	0 11 40.10	1 18 53.6	.9834999	5 8.0	7 58 3.2	2 24 48.1	.97507
7	0 11 52.59	1 17 17.9	.9842245	5 4.3	8 0 6.1	2 24 49.4	.9750
8	0 12 5.43	1 15 40.1	.9849449	5 0.6	8 2 9.0	2 24 50.7	.9750
9	0 12 18.62	1 14 0.1	.9856607	4 56.9	8 4 11.9	2 24 52.1	.9750
10	0 12 32.15	1 12 18.1	.9863718	4 53.2	8 6 14.8	2 24 53.4	.9750
11	0 12 46.02	1 10 34.0	.9870781	4 49.5	8 8 17.8	2 24 54.7	.9750
12	0 13 0.22	1 8 47.9	.9877793	4 45.8	8 10 20.7	2 24 56.0	.9749
13	0 13 14.76	1 6 59.7	.9884752	4 42.1	8 12 23.7	2 24 57.3	.9749
14	0 13 29.62	1 5 9.6	.9891657	4 38.4	8 14 26.6	2 24 58.6	.9749
15	0 13 44.81	1 3 17.5	.9898507	4 34.7	8 16 29.6	2 24 59.9	.9749
16	0 14 0.32	1 1 23.5	.9905299	4 31.1	8 18 32.6	2 25 1.2	.9749
17	0 14 16.14	0 59 27.6	.9912031	4 27.4	8 20 35.6	2 25 2.5	.9749
18	0 14 32.28	0 57 29.8	.9918703	4 23.7	8 22 38.5	2 25 3.8	.9749
19	0 14 48.72	0 55 30.2	.9925312	4 20.1	8 24 41.5	2 25 5.1	.9748
20	0 15 5.46	0 53 28.7	.9931858	4 16.4	8 26 44.5	2 25 6.4	.9748
21	0 15 22.51	0 51 25.4	.9938339	4 12.8	8 28 47.6	2 25 7.6	.9748
22	0 15 39.86	0 49 20.4	.9944753	4 9.1	8 30 50.6	2 25 8.9	.9748
23	0 15 57.49	0 47 13.6	.9951100	4 5.5	8 32 53.6	2 25 10.2	.9748
24	0 16 15.41	0 45 5.1	.9957378	4 1.9	8 34 56.6	2 25 11.5	.9748
25	0 16 33.61	0 42 54.9	.9963586	3 58.2	8 36 59.6	2 25 12.7	.9748
26	0 16 52.09	0 40 43.1	.9969723	3 54.6	8 39 2.7	2 25 14.0	.9747
27	0 17 10.85	0 38 29.7	.9975788	3 51.0	8 41 5.7	2 25 15.3	.9747
28	0 17 29.88	0 36 14.7	.9981780	3 47.4	8 43 8.8	2 25 16.5	.9747
29	0 17 49.18	0 33 58.1	.9987698	3 43.7	8 45 11.8	2 25 17.8	.9747
30	0 18 8.74	0 31 40.0	.9993541	3 40.1	8 47 14.9	2 25 19.0	.9747
31	0 18 28.56	0 29 20.4	0.9999308	3 36.5	8 49 17.9	2 25 20.3	.9747
32	0 18 48.64	S. 0 26 59.4	1.0004997	3 32.9	8 51 21.0	S. 2 25 21.5	0.9747



## JANUARY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<i>h m s</i>	<i>s</i>	<i>s</i>	<i>° ′ ″</i>	<i>"</i>	<i>"</i>	<i>"</i>
0 10 45.33	+ 0.44	0.57	S. 1 26 0.0	+ 3.5	7.9	0.9
0 10 56.10	0.46	0.57	1 24 35.1	3.6	7.9	0.9
0 11 7.23	0.47	0.57	1 23 7.9	3.7	7.9	0.9
0 11 18.71	0.49	0.57	1 21 38.6	3.8	7.9	0.9
0 11 30.55	0.50	0.57	1 20 7.0	3.9	7.9	0.9
0 11 42.74	0.52	0.57	1 18 33.3	4.0	7.8	0.9
0 11 55.27	0.53	0.57	1 16 57.4	4.1	7.8	0.9
0 12 8.15	0.54	0.57	1 15 19.4	4.1	7.8	0.9
0 12 21.38	0.56	0.57	1 13 39.3	4.2	7.8	0.9
0 12 34.95	0.57	0.57	1 11 57.1	4.3	7.8	0.9
0 12 48.85	0.59	0.57	1 10 12.8	4.4	7.8	0.9
0 13 3.08	0.60	0.56	1 8 26.6	4.5	7.7	0.9
0 13 17.64	0.61	0.56	1 6 38.3	4.6	7.7	0.9
0 13 32.53	0.63	0.56	1 4 48.1	4.6	7.7	0.9
0 13 47.74	0.64	0.56	1 2 55.9	4.7	7.7	0.9
0 14 3.27	0.65	0.56	1 1 1.8	4.8	7.7	0.9
0 14 19.11	0.67	0.56	0 59 5.9	4.9	7.7	0.9
0 14 35.26	0.68	0.56	0 57 8.1	4.9	7.7	0.9
0 14 51.72	0.69	0.55	0 55 8.4	5.0	7.6	0.9
0 15 8.47	0.70	0.55	0 53 6.9	5.1	7.6	0.9
0 15 25.53	0.72	0.55	0 51 3.6	5.2	7.6	0.9
0 15 42.88	0.73	0.55	0 48 38.6	5.2	7.6	0.9
0 16 0.52	0.74	0.55	0 46 51.8	5.3	7.6	0.9
0 16 18.45	0.75	0.55	0 44 43.4	5.4	7.6	0.9
0 16 36.65	0.76	0.55	0 42 33.3	5.4	7.6	0.9
0 16 55.13	0.78	0.55	0 40 21.2	5.5	7.6	0.9
0 17 13.89	0.79	0.55	0 38 8.1	5.6	7.6	0.9
0 17 32.91	0.80	0.54	0 35 53.6	5.6	7.6	0.9
0 17 52.20	0.81	0.54	0 33 40.3	5.7	7.6	0.9
0 18 11.76	0.82	0.54	0 31 18.8	5.7	7.6	0.9
0 18 31.57	0.83	0.54	0 28 59.3	5.8	7.6	0.9
0 18 51.63	+ 0.84	0.54	0 26 18.1	5.8	7.6	0.9

## FEBRUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<i>h m s</i>	<i>° ' "</i>		<i>h m</i>	<i>° ' "</i>	<i>° ' "</i>	
1	0 18 48.61	S. 0 26 59.4	1.0004997	3 32.9	8 51 21.0	S. 2 25 21.5	0.97
2	0 19 8.98	0 24 36.9	.0010608	3 29.3	8 53 24.1	2 25 22.8	.97
3	0 19 29.56	0 22 12.9	.0016140	3 25.8	8 55 27.2	2 25 24.0	.97
4	0 19 50.38	0 19 47.6	.0021592	3 22.2	8 57 30.3	2 25 25.3	.97
5	0 20 11.45	0 17 20.9	.0026963	3 18.6	8 59 33.4	2 25 26.5	.97
6	0 20 32.75	0 14 52.9	.0032251	3 15.0	9 1 36.5	2 25 27.7	.97
7	0 20 54.28	0 12 23.5	.0037455	3 11.5	9 3 39.6	2 25 28.9	.97
8	0 21 16.05	0 9 52.9	.0042574	3 7.9	9 5 42.7	2 25 30.2	.97
9	0 21 38.04	0 7 21.0	.0047608	3 4.3	9 7 45.8	2 25 31.4	.97
10	0 22 0.25	0 4 47.9	.0052555	3 0.7	9 9 49.0	2 25 32.6	.97
11	0 22 22.68	S. 0 2 13.6	.0057413	2 57.2	9 11 52.1	2 25 33.8	.97
12	0 22 45.33	N. 0 0 21.8	.0062183	2 53.6	9 13 55.3	2 25 35.0	.97
13	0 23 8.18	0 2 58.4	.0066863	2 50.1	9 15 58.4	2 25 36.3	.97
14	0 23 31.24	0 5 36.1	.0071452	2 46.5	9 18 1.6	2 25 37.5	.97
15	0 23 54.49	0 8 14.8	.0075950	2 43.0	9 20 4.7	2 25 38.7	.97
16	0 24 17.94	0 10 54.6	.0080357	2 39.4	9 22 7.9	2 25 39.9	.97
17	0 24 41.58	0 13 35.4	.0084671	2 35.9	9 24 11.1	2 25 41.1	.97
18	0 25 5.40	0 16 17.1	.0088892	2 32.3	9 26 14.3	2 25 42.3	.97
19	0 25 29.40	0 18 59.8	.0093020	2 28.8	9 28 17.5	2 25 43.4	.97
20	0 25 53.57	0 21 43.4	.0097053	2 25.3	9 30 20.7	2 25 44.6	.97
21	0 26 17.91	0 24 27.8	.0100992	2 21.8	9 32 23.9	2 25 45.8	.97
22	0 26 42.42	0 27 13.1	.0104836	2 18.2	9 34 27.1	2 25 47.0	.97
23	0 27 7.09	0 29 59.2	.0108584	2 14.7	9 36 30.3	2 25 48.2	.97
24	0 27 31.91	0 32 46.1	.0112237	2 11.2	9 38 33.5	2 25 49.4	.97
25	0 27 56.89	0 35 33.7	.0115793	2 7.7	9 40 36.8	2 25 50.5	.97
26	0 28 22.02	0 38 22.1	.0119252	2 4.2	9 42 40.0	2 25 51.7	.97
27	0 28 47.30	0 41 11.2	.0122614	2 0.6	9 44 43.3	2 25 52.9	.97
28	0 29 12.72	0 44 0.9	.0125878	1 57.1	9 46 46.5	2 25 54.0	.97
29	0 29 38.28	N. 0 46 51.3	1.0129044	1 53.6	9 48 49.8	S. 2 25 55.2	0.97



## FEBRUARY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<i>h m s</i>	<i>s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>	<i>"</i>
0 18 51.63	+ 0.84	0.54	S. 0 26 38.4	+ 5.9	7.5	0.9
0 19 11.93	0.85	0.54	0 24 16.0	6.0	7.5	0.9
0 19 32.52	0.86	0.54	0 21 52.2	6.0	7.5	0.9
0 19 53.32	0.87	0.54	0 19 27.1	6.1	7.5	0.9
0 20 14.37	0.88	0.54	0 17 0.6	6.1	7.5	0.9
0 20 35.65	0.89	0.54	0 14 32.7	6.2	7.4	0.9
0 20 57.16	0.90	0.54	0 12 3.6	6.2	7.4	0.9
0 21 18.90	0.91	0.54	0 9 33.2	6.3	7.4	0.8
0 21 40.87	0.92	0.54	0 7 1.5	6.3	7.4	0.8
0 22 3.06	0.93	0.54	0 4 28.6	6.4	7.4	0.8
0 22 25.46	0.94	0.54	S. 0 1 54.5	6.4	7.4	0.8
0 22 48.07	0.95	0.54	N. 0 0 40.7	6.5	7.4	0.8
0 23 10.89	0.96	0.54	0 3 17.0	6.5	7.4	0.8
0 23 33.92	0.96	0.54	0 5 54.4	6.6	7.4	0.8
0 23 57.14	0.97	0.54	0 8 32.9	6.6	7.4	0.8
0 24 20.55	0.98	0.54	0 11 12.3	6.7	7.4	0.8
0 24 44.15	0.99	0.54	0 13 52.8	6.7	7.4	0.8
0 25 7.93	0.99	0.53	0 16 34.3	6.7	7.3	0.8
0 25 31.89	1.00	0.53	0 19 16.6	6.8	7.3	0.8
0 25 56.02	1.01	0.53	0 21 59.9	6.8	7.3	0.8
0 26 20.32	1.02	0.53	0 24 44.0	6.9	7.3	0.8
0 26 44.78	1.03	0.53	0 27 29.0	6.9	7.3	0.8
0 27 9.40	1.03	0.53	0 30 14.8	6.9	7.3	0.8
0 27 34.18	1.04	0.53	0 33 1.3	7.0	7.3	0.8
0 27 59.12	1.04	0.53	0 35 48.6	7.0	7.3	
0 28 24.20	1.05	0.53	0 38 36.7	7.0	7.3	
0 28 49.42	1.05	0.53	0 41 25.4	7.0	7.3	
0 29 14.79	1.06	0.53	0 44 14.7	7.1	7.3	
0 29 40.30	+ 1.07	0.53	N. 0 47 4.7	+ 7.1	7.3	

## MARCH, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	0 29 38.28	N.0 46 51.3	1.0129044	1 53.6	9 48 49.8	S. 2 25 55.2	0.974
2	0 30 3.98	0 49 42.2	.0132112	1 50.1	9 50 53.0	2 25 56.4	.974
3	0 30 29.80	0 52 33.8	.0135081	1 46.6	9 52 56.3	2 25 57.5	.974
4	0 30 55.76	0 55 25.9	.0137950	1 43.1	9 54 59.6	2 25 58.7	.974
5	0 31 21.84	0 58 18.6	.0140720	1 39.6	9 57 2.9	2 25 59.8	.974
6	0 31 48.03	1 1 11.8	.0143390	1 36.1	9 59 6.2	2 26 1.0	.974
7	0 32 14.34	1 4 5.5	.0145960	1 32.6	10 1 9.5	2 26 2.1	.974
8	0 32 40.76	1 6 59.6	.0148428	1 29.1	10 3 12.8	2 26 3.3	.974
9	0 33 7.28	1 9 54.2	.0150796	1 25.6	10 5 16.1	2 26 4.4	.974
10	0 33 33.91	1 12 49.1	.0153061	1 22.1	10 7 19.4	2 26 5.5	.974
11	0 34 0.63	1 15 44.4	.0155224	1 18.7	10 9 22.8	2 26 6.7	.974
12	0 34 27.45	1 18 40.1	.0157284	1 15.2	10 11 26.1	2 26 7.8	.974
13	0 34 54.36	1 21 36.0	.0159241	1 11.7	10 13 29.5	2 26 8.9	.974
14	0 35 21.35	1 24 32.2	.0161094	1 8.2	10 15 32.8	2 26 10.0	.974
15	0 35 48.42	1 27 28.7	.0162843	1 4.7	10 17 36.2	2 26 11.2	.974
16	0 36 15.56	1 30 25.4	.0164489	1 1.2	10 19 39.6	2 26 12.3	.974
17	0 36 42.78	1 33 22.2	.0166031	0 57.8	10 21 42.9	2 26 13.4	.974
18	0 37 10.06	1 36 19.2	.0167469	0 54.3	10 23 46.3	2 26 14.5	.974
19	0 37 37.40	1 39 16.3	.0168803	0 50.8	10 25 49.7	2 26 15.6	.974
20	0 38 4.80	1 42 13.5	.0170032	0 47.3	10 27 53.1	2 26 16.7	.974
21	0 38 32.26	1 45 10.8	.0171158	0 43.8	10 29 56.5	2 26 17.8	.974
22	0 38 59.76	1 48 8.2	.0172180	0 40.4	10 31 59.9	2 26 18.9	.974
23	0 39 27.30	1 51 5.5	.0173098	0 36.9	10 34 3.4	2 26 20.0	.973
24	0 39 54.89	1 54 2.8	.0173913	0 33.4	10 36 6.8	2 26 21.1	.973
25	0 40 22.51	1 57 0.0	.0174625	0 29.9	10 38 10.2	2 26 22.2	.973
26	0 40 50.17	1 59 57.2	.0175233	0 26.5	10 40 13.7	2 26 23.3	.973
27	0 41 17.86	2 2 54.3	.0175738	0 23.0	10 42 17.1	2 26 24.4	.973
28	0 41 45.57	2 5 51.3	.0176140	0 19.5	10 44 20.6	2 26 25.4	.973
29	0 42 13.31	2 8 48.1	.0176438	0 16.1	10 46 24.1	2 26 26.5	.973
30	0 42 41.06	2 11 44.7	.0176632	0 12.6	10 48 27.6	2 26 27.6	.973
31	0 43 8.83	2 14 41.2	.0176723	0 9.1	10 50 31.1	2 26 28.7	.973
32	0 43 36.61	N.2 17 37.4	1.0176710	0 5.7	10 52 34.6	S. 2 26 29.7	0.973



## MARCH, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
0 29 40.30	+ 1.07	0.53	N. 0 47 4.7	+ 7.1	7.3	0.8
0 30 5.95	1.07	0.53	0 49 55.3	7.1	7.3	0.8
0 30 31.72	1.08	0.53	0 52 46.5	7.1	7.3	0.8
0 30 57.62	1.08	0.53	0 55 38.3	7.2	7.3	0.8
0 31 23.64	1.09	0.53	0 58 30.6	7.2	7.3	0.8
0 31 49.78	1.09	0.53	1 1 23.4	7.2	7.2	0.8
0 32 16.04	1.10	0.53	1 4 16.7	7.2	7.2	0.8
0 32 42.40	1.10	0.53	1 7 10.4	7.2	7.2	0.8
0 33 8.86	1.10	0.53	1 10 4.6	7.3	7.2	0.8
0 33 35.43	1.11	0.53	1 12 59.1	7.3	7.2	0.8
0 34 2.10	1.11	0.53	1 15 54.0	7.3	7.2	0.8
0 34 28.85	1.12	0.53	1 18 49.3	7.3	7.2	0.8
0 34 55.70	1.12	0.53	1 21 44.8	7.3	7.2	0.8
0 35 22.63	1.12	0.53	1 24 40.6	7.3	7.2	0.8
0 35 49.64	1.13	0.53	1 27 36.6	7.3	7.2	0.8
0 36 16.72	1.13	0.53	1 30 32.9	7.3	7.2	0.8
0 36 43.87	1.13	0.53	1 33 29.3	7.4	7.2	0.8
0 37 11.09	1.14	0.53	1 36 25.9	7.4	7.2	0.8
0 37 38.37	1.14	0.53	1 39 22.6	7.4	7.2	0.8
0 38 5.70	1.14	0.53	1 42 19.3	7.4	7.2	0.8
0 38 33.09	1.14	0.53	1 45 16.2	7.4	7.2	0.8
0 39 0.53	1.14	0.53	1 48 13.1	7.4	7.2	0.8
0 39 28.01	1.15	0.53	1 51 10.0	7.4	7.2	0.8
0 39 55.53	1.15	0.53	1 54 6.9	7.4	7.1	0.8
0 40 23.09	1.15	0.53	1 57 3.7	7.4		
0 40 50.68	1.15	0.53	2 0 0.5	7.4		
0 41 18.30	1.15	0.53	2 2 57.1	7.4		
0 41 45.95	1.15	0.53	2 5 53.7			
0 42 13.62	1.15	0.53	2 8 50.0			
0 42 41.31	1.15	0.53	2 11 46.2			
0 43 9.01	1.15	0.53	2 14 42.3			
0 43 36.72	+ 1.15	0.53	N. 2 17 38.1			

APRIL, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lo Rad
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	0 43 36.61	N. 2 17 37.4	1.0176710	0 5.7	10 52 34.6	S. 2 26 29.7	0.973
2	0 44 4.40	2 20 33.4	.0176594	{ <sup>0</sup> <sub>23</sub> <sup>55.8</sup> <sub>3</sub> }	10 54 38.1	2 26 30.8	.973
3	0 44 32.19	2 23 29.1	.0176374	23 55.3	10 56 41.6	2 26 31.8	.973
4	0 44 59.98	2 26 24.5	.0176051	23 51.8	10 58 45.1	2 26 32.9	.973
5	0 45 27.76	2 29 19.6	.0175624	23 48.3	11 0 48.7	2 26 34.0	.973
6	0 45 55.54	2 32 14.4	.0175094	23 44.8	11 2 52.2	2 26 35.0	.973
7	0 46 23.30	2 35 8.7	.0174460	23 41.3	11 4 55.8	2 26 36.1	.973
8	0 46 51.05	2 38 2.7	.0173723	23 37.9	11 6 59.3	2 26 37.1	.973
9	0 47 18.78	2 40 56.2	.0172883	23 34.4	11 9 2.9	2 26 38.1	.973
10	0 47 46.48	2 43 49.3	.0171940	23 30.9	11 11 6.5	2 26 39.2	.973
11	0 48 14.15	2 46 41.9	.0170893	23 27.4	11 13 10.1	2 26 40.2	.973
12	0 48 41.79	2 49 34.0	.0169743	23 24.0	11 15 13.7	2 26 41.2	.973
13	0 49 9.39	2 52 25.5	.0168491	23 20.5	11 17 17.3	2 26 42.3	.973
14	0 49 36.95	2 55 16.5	.0167136	23 17.0	11 19 20.9	2 26 43.3	.973
15	0 50 4.46	2 58 6.8	.0165679	23 13.5	11 21 24.5	2 26 44.3	.973
16	0 50 31.92	3 0 56.6	.0164120	23 10.1	11 23 28.1	2 26 45.3	.973
17	0 50 59.32	3 3 45.7	.0162460	23 6.6	11 25 31.8	2 26 46.4	.973
18	0 51 26.66	3 6 34.1	.0160699	23 3.1	11 27 35.4	2 26 47.4	.973
19	0 51 53.94	3 9 21.9	.0158837	22 59.6	11 29 39.1	2 26 48.4	.973
20	0 52 21.15	3 12 8.9	.0156875	22 56.1	11 31 42.7	2 26 49.4	.973
21	0 52 48.29	3 14 55.2	.0154814	22 52.7	11 33 46.4	2 26 50.4	.973
22	0 53 15.35	3 17 40.7	.0152653	22 49.2	11 35 50.1	2 26 51.4	.973
23	0 53 42.34	3 20 25.4	.0150393	22 45.7	11 37 53.8	2 26 52.4	.973
24	0 54 9.24	3 23 9.3	.0148035	22 42.2	11 39 57.5	2 26 53.4	.973
25	0 54 36.06	3 25 52.3	.0145579	22 38.7	11 42 1.2	2 26 54.4	.973
26	0 55 2.79	3 28 34.5	.0143026	22 35.2	11 44 5.0	2 26 55.4	.973
27	0 55 29.43	3 31 15.8	.0140376	22 31.7	11 46 8.7	2 26 56.4	.973
28	0 55 55.98	3 33 56.2	.0137629	22 28.2	11 48 12.5	2 26 57.3	.973
29	0 56 22.42	3 36 35.7	.0134785	22 24.7	11 50 16.2	2 26 58.3	.973
30	0 56 48.76	3 39 14.3	.0131846	22 21.3	11 52 20.0	2 26 59.3	.973
31	0 57 15.00	N. 3 41 51.9	1.0128811	22 17.8	11 54 23.8	S. 2 27 0.3	0.973



## APRIL, 1850.

At Transit over the Meridian of Greenwich.

Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
36° 72'	+ 1' 15"	0' 53"	N. 2 17 38' 1"	+ 7' 3"	7' 2"	0' 8"
32 16	{ 1' 15"	{ 0' 53"	{ 2 20 33' 6"	{ 7' 3"	{ 7' 2"	{ 0' 8"
59 88	1' 16"	0' 53"	2 26 23' 9"	7' 3"	7' 2"	0' 8"
27 60	1' 16"	0' 53"	2 29 18' 6"	7' 3"	7' 2"	0' 8"
55 31	1' 16"	0' 53"	2 32 12' 9"	7' 3"	7' 2"	0' 8"
23 01	1' 16"	0' 53"	2 35 6' 9"	7' 2"	7' 2"	0' 8"
50 69	1' 15"	0' 53"	2 38 0' 5"	7' 2"	7' 2"	0' 8"
18 35	1' 15"	0' 53"	2 40 53' 6"	7' 2"	7' 2"	0' 8"
45 99	1' 15"	0' 53"	2 43 46' 2"	7' 2"	7' 2"	0' 8"
13 60	1' 15"	0' 53"	2 46 38' 4"	7' 2"	7' 2"	0' 8"
41 17	1' 15"	0' 53"	2 49 30' 1"	7' 1"	7' 2"	0' 8"
8 70	1' 15"	0' 53"	2 52 21' 2"	7' 1"	7' 2"	0' 8"
36 19	1' 14"	0' 53"	2 55 11' 8"	7' 1"	7' 2"	0' 8"
3 64	1' 14"	0' 53"	2 58 1' 8"	7' 1"	7' 2"	0' 8"
31 03	1' 14"	0' 53"	3 0 51' 2"	7' 0"	7' 2"	0' 8"
58 37	1' 14"	0' 53"	3 3 39' 9"	7' 0"	7' 2"	0' 8"
25 65	1' 14"	0' 53"	3 6 27' 9"	7' 0"	7' 2"	0' 8"
52 86	1' 13"	0' 53"	3 9 15' 3"	7' 0"	7' 2"	0' 8"
20 01	1' 13"	0' 53"	3 12 1' 9"	6' 9"	7' 2"	0' 8"
47 09	1' 13"	0' 53"	3 14 47' 8"	6' 9"	7' 2"	0' 8"
14 09	1' 12"	0' 53"	3 17 33' 0"	6' 9"	7' 2"	0' 8"
41 01	1' 12"	0' 53"	3 20 17' 3"	6' 8"	7' 2"	0' 8"
7 86	1' 12"	0' 53"	3 23 0' 8"	6' 8"	7' 2"	0' 8"
34 62	1' 11"	0' 53"	3 25 43' 5"	6' 8"	7' 2"	0' 8"
1 29	1' 11"	0' 53"	3 28 25' 4"	6' 7"	7	
27 87	1' 11"	0' 53"	3 31 6' 3"	6' 7"		
54 35	1' 10"	0' 53"	3 33 46' 4"	6' 7"		
20 74	1' 10"	0' 53"	3 36 25' 6"	6' 6"		
47 02	1' 09"	0' 53"	3 39 3' 8"	6'		
13 20	1' 09"	0' 53"	3 41 41' 1"	6'		
39 27	+ 1' 08"	0' 53"	N. 3 44 17' 4"	+ 6'		

MAY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No
1	<sup>h</sup> 0 <sup>m</sup> 57 <sup>s</sup> 15.00	<sup>°</sup> N. 3 41 51.9	1.0128811	<sup>h</sup> 22 <sup>m</sup> 17.8	<sup>°</sup> 11 54 23.8	<sup>°</sup> S. 2 27 0.3	0.973
2	0 57 41.12	3 44 28.5	.0125681	22 14.3	11 56 27.6	2 27 1.2	.973
3	0 58 7.13	3 47 4.1	.0122456	22 10.8	11 58 31.3	2 27 2.2	.973
4	0 58 33.02	3 49 38.6	.0119136	22 7.3	12 0 35.1	2 27 3.2	.973
5	0 58 58.79	3 52 12.1	.0115721	22 3.8	12 2 39.0	2 27 4.1	.973
6	0 59 24.43	3 54 44.5	.0112212	22 0.2	12 4 42.8	2 27 5.1	.973
7	0 59 49.94	3 57 15.7	.0108610	21 56.7	12 6 46.6	2 27 6.0	.973
8	1 0 15.31	3 59 45.9	.0104914	21 53.2	12 8 50.5	2 27 7.0	.973
9	1 0 40.54	4 2 14.8	.0101126	21 49.7	12 10 54.3	2 27 7.9	.973
10	1 1 5.63	4 4 42.6	.0097246	21 46.2	12 12 58.2	2 27 8.9	.973
11	1 1 30.57	4 7 9.2	.0093275	21 42.7	12 15 2.0	2 27 9.8	.973
12	1 1 55.36	4 9 34.6	.0089213	21 39.1	12 17 5.9	2 27 10.8	.973
13	1 2 20.00	4 11 58.7	.0085062	21 35.6	12 19 9.8	2 27 11.7	.973
14	1 2 44.48	4 14 21.5	.0080821	21 32.1	12 21 13.7	2 27 12.6	.973
15	1 3 8.79	4 16 43.0	.0076492	21 28.5	12 23 17.6	2 27 13.6	.973
16	1 3 32.93	4 19 3.2	.0072075	21 25.0	12 25 21.5	2 27 14.5	.973
17	1 3 56.90	4 21 22.1	.0067571	21 21.5	12 27 25.5	2 27 15.4	.973
18	1 4 20.69	4 23 39.6	.0062981	21 17.9	12 29 29.4	2 27 16.3	.973
19	1 4 44.30	4 25 55.7	.0058306	21 14.4	12 31 33.3	2 27 17.3	.973
20	1 5 7.72	4 28 10.4	.0053547	21 10.8	12 33 37.3	2 27 18.2	.973
21	1 5 30.96	4 30 23.6	.0048704	21 7.3	12 35 41.3	2 27 19.1	.973
22	1 5 54.01	4 32 35.5	.0043779	21 3.7	12 37 45.2	2 27 20.0	.973
23	1 6 16.86	4 34 45.8	.0038772	21 0.2	12 39 49.2	2 27 20.9	.973
24	1 6 39.52	4 36 54.7	.0033685	20 56.6	12 41 53.2	2 27 21.8	.973
25	1 7 1.98	4 39 2.0	.0028518	20 53.1	12 43 57.2	2 27 22.7	.973
26	1 7 24.23	4 41 7.9	.0023272	20 49.5	12 46 1.2	2 27 23.6	.973
27	1 7 46.28	4 43 12.2	.0017947	20 45.9	12 48 5.2	2 27 24.5	.973
28	1 8 8.12	4 45 14.9	.0012544	20 42.4	12 50 9.3	2 27 25.4	.973
29	1 8 29.75	4 47 16.1	.0007064	20 38.8	12 52 13.3	2 27 26.3	.973
30	1 8 51.16	4 49 15.7	1.0001507	20 35.2	12 54 17.4	2 27 27.2	.973
31	1 9 12.35	4 51 13.7	0.9995874	20 31.6	12 56 21.4	2 27 28.1	.973
32	1 9 33.31	N. 4 53 10.0	0.9990167	20 28.0	12 58 25.5	S. 2 27 28.9	0.973



## MAY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
0 57 39.27	+ 1.08	0.53	N. 3 44 17.4	+ 6.5	7.3	0.8
0 58 5.23	1.08	0.53	3 46 52.7	6.4	7.3	0.8
0 58 31.07	1.07	0.53	3 49 26.9	6.4	7.3	0.8
0 58 56.78	1.07	0.53	3 52 0.1	6.4	7.3	0.8
0 59 22.36	1.06	0.53	3 54 32.2	6.3	7.3	0.8
0 59 47.82	1.06	0.53	3 57 3.2	6.3	7.3	0.8
1 0 13.14	1.05	0.53	3 5 43.1	6.2	7.3	0.8
1 0 38.32	1.05	0.53	4 2 1.8	6.2	7.3	0.8
1 1 3.36	1.04	0.53	4 4 29.3	6.1	7.3	0.8
1 1 28.26	1.03	0.53	4 6 55.6	6.1	7.3	0.8
1 1 53.01	1.03	0.53	4 9 20.7	6.0	7.3	0.8
1 2 17.60	1.02	0.54	4 11 44.6	6.0	7.4	0.8
1 2 42.03	1.01	0.54	4 14 7.2	5.9	7.4	0.8
1 3 6.30	1.01	0.54	4 16 28.5	5.9	7.4	0.8
1 3 30.40	1.00	0.54	4 18 48.5	5.8	7.4	0.8
1 3 54.33	0.99	0.54	4 21 7.2	5.8	7.4	0.8
1 4 18.08	0.99	0.54	4 23 24.5	5.7	7.4	0.8
1 4 41.65	0.98	0.54	4 25 40.4	5.6	7.4	0.8
1 5 5.04	0.97	0.54	4 27 55.0	5.6	7.4	0.8
1 5 28.24	0.96	0.54	4 30 8.1	5.5	7.4	0.8
1 5 51.25	0.95	0.54	4 32 19.7	5.5	7.4	0.8
1 6 14.07	0.95	0.54	4 34 29.9	5.4		0
1 6 36.70	0.94	0.54	4 36 38.6	5.3		0
1 6 59.13	0.93	0.54	4 38 45.9	5.2		0
1 7 21.36	0.92	0.54	4 40 51.6	5.2		
1 7 43.38	0.91	0.54	4 42 55.8	5		
1 8 5.19	0.90	0.54	4 44 58.5	5		
1 8 26.79	0.90	0.55	4 46 59.6			
1 8 48.18	0.89	0.54	4 48 59.1			
1 9 9.35	0.88	0.54	4 50 57.0			
1 9 30.29	0.87	0.54	4 52 53.3			
1 9 51.01	+ 0.86	0.54	N. 4 54 48.0			

JUNE, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. V.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 9 33.31	N.4 53 10.0	0.9990167	20 28.0	12 58 25.5	S. 2 27 28.9	0.9730
2	1 9 54.04	4 55 4.7	.9984385	20 24.5	13 0 29.6	2 27 29.8	.9729
3	1 10 14.54	4 56 57.8	.9978530	20 20.9	13 2 33.6	2 27 30.7	.9729
4	1 10 34.80	4 58 49.1	.9972603	20 17.3	13 4 37.7	2 27 31.6	.9729
5	1 10 54.82	5 0 38.7	.9966604	20 13.7	13 6 41.8	2 27 32.4	.9729
6	1 11 14.59	5 2 26.6	.9960535	20 10.0	13 8 45.9	2 27 33.3	.9729
7	1 11 34.11	5 4 12.7	.9954397	20 6.4	13 10 50.1	2 27 34.1	.9729
8	1 11 53.38	5 5 57.1	.9948191	20 2.8	13 12 54.2	2 27 35.0	.9729
9	1 12 12.39	5 7 39.6	.9941918	19 59.2	13 14 58.3	2 27 35.9	.9729
10	1 12 31.13	5 9 20.3	.9935579	19 55.6	13 17 2.5	2 27 36.7	.9729
11	1 12 49.61	5 10 59.1	.9929175	19 51.9	13 19 6.6	2 27 37.6	.9729
12	1 13 7.81	5 12 36.1	.9922708	19 48.3	13 21 10.8	2 27 38.4	.9729
13	1 13 25.74	5 14 11.2	.9916179	19 44.7	13 23 14.9	2 27 39.2	.9729
14	1 13 43.40	5 15 44.4	.9909590	19 41.0	13 25 19.1	2 27 40.1	.9729
15	1 14 0.78	5 17 15.7	.9902942	19 37.4	13 27 23.3	2 27 40.9	.9729
16	1 14 17.87	5 18 45.1	.9896236	19 33.7	13 29 27.5	2 27 41.8	.9729
17	1 14 34.68	5 20 12.6	.9889474	19 30.1	13 31 31.7	2 27 42.6	.9727
18	1 14 51.20	5 21 38.1	.9882658	19 26.4	13 33 35.9	2 27 43.4	.9727
19	1 15 7.43	5 23 1.7	.9875788	19 22.7	13 35 40.1	2 27 44.2	.9727
20	1 15 23.37	5 24 23.3	.9868866	19 19.1	13 37 44.3	2 27 45.1	.9727
21	1 15 39.00	5 25 42.9	.9861893	19 15.4	13 39 48.6	2 27 45.9	.9727
22	1 15 54.34	5 27 0.5	.9854870	19 11.7	13 41 52.8	2 27 46.7	.9727
23	1 16 9.37	5 28 16.1	.9847799	19 8.0	13 43 57.0	2 27 47.5	.9727
24	1 16 24.10	5 29 29.6	.9840680	19 4.3	13 46 1.3	2 27 48.3	.9726
25	1 16 38.51	5 30 41.1	.9833516	19 0.6	13 48 5.6	2 27 49.1	.9726
26	1 16 52.61	5 31 50.6	.9826308	18 56.9	13 50 9.8	2 27 49.9	.9726
27	1 17 6.40	5 32 57.9	.9819056	18 53.2	13 52 14.1	2 27 50.7	.9726
28	1 17 19.86	5 34 3.2	.9811763	18 49.5	13 54 18.4	2 27 51.5	.9726
29	1 17 33.00	5 35 6.4	.9804430	18 45.8	13 56 22.7	2 27 52.3	.9726
30	1 17 45.82	5 36 7.4	.9797058	18 42.1	13 58 27.0	2 27 53.1	.9726
31	1 17 58.30	N.5 37 6.3	0.9789649	18 38.3	14 0 31.3	S. 2 27 53.9	0.9725



## JUNE, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1 9 51.01	+ 0.86	0.54	N. 4 54 48.0	+ 4.7	7.5	0.9
1 10 11.49	0.85	0.54	4 56 41.0	4.7	7.5	0.9
1 10 31.73	0.84	0.55	4 58 32.3	4.6	7.6	0.9
1 10 51.74	0.83	0.55	5 0 21.9	4.5	7.6	0.9
1 11 11.50	0.82	0.55	5 2 9.8	4.5	7.6	0.9
1 11 31.01	0.81	0.55	5 3 55.9	4.4	7.6	0.9
1 11 50.27	0.80	0.55	5 5 40.2	4.3	7.6	0.9
1 12 9.27	0.79	0.55	5 7 22.8	4.2	7.6	0.9
1 12 28.01	0.78	0.55	5 9 3.6	4.2	7.6	0.9
1 12 46.49	0.76	0.55	5 10 42.5	4.1	7.6	0.9
1 13 4.70	0.75	0.56	5 12 19.5	4.0	7.7	0.9
1 13 22.63	0.74	0.56	5 13 54.7	3.9	7.7	0.9
1 13 40.29	0.73	0.56	5 15 28.0	3.8	7.7	0.9
1 13 57.67	0.72	0.56	5 16 59.4	3.8	7.7	0.9
1 14 14.77	0.71	0.56	5 18 28.9	3.7	7.7	0.9
1 14 31.59	0.70	0.56	5 19 56.5	3.6	7.7	0.9
1 14 48.13	0.68	0.56	5 21 22.2	3.5	7.7	0.9
1 15 4.37	0.67	0.56	5 22 45.9	3.4	7.7	0.9
1 15 20.32	0.66	0.56	5 24 7.7	3.4	7.8	0.9
1 15 35.98	0.66	0.56	5 25 27.5	3.3	7.8	0.9
1 15 51.33	0.63	0.56	5 26 45.3	3.2	7.8	0.9
1 16 6.38	0.62	0.56	5 28 1.1	3.1	7.8	0.9
1 16 21.13	0.61	0.56	5 29 14.9	3.0	7.8	0.9
1 16 35.58	0.60	0.56	5 30 26.6	2.9	7.8	0.9
1 16 49.71	0.58	0.56	5 31 36.3	2.9	7.8	0.9
1 17 3.52	0.57	0.56	5 32 43.9	2.8	7.8	0.9
1 17 17.02	0.56	0.56	5 33 49.5	2.7	7.9	0.9
1 17 30.20	0.54	0.57	5 34 52.9	2.6	7.9	0.9
1 17 43.05	0.53	0.57	5 35 54.3	2.5	7.9	0.9
1 17 55.57	0.52	0.57	5 36 53.5	2.4	7.9	0.9
1 18 7.77	+ 0.50	0.57	N. 5 37 50.6	+ 2.3	7.9	0.9

JULY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	N
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 17 58.30	N. 5 37 6.3	0.9789649	18 38.3	14 0 31.3	S. 2 27 53.9	0.97
2	1 18 10.45	5 38 3.1	.9782204	18 34.6	14 2 35.6	2 27 54.7	.97
3	1 18 22.27	5 38 57.7	.9774725	18 30.9	14 4 39.9	2 27 55.5	.97
4	1 18 33.75	5 39 50.1	.9767213	18 27.1	14 6 44.2	2 27 56.2	.97
5	1 18 44.89	5 40 40.3	.9759670	18 23.4	14 8 48.5	2 27 57.0	.97
6	1 18 55.68	5 41 28.4	.9752097	18 19.6	14 10 52.9	2 27 57.8	.97
7	1 19 6.12	5 42 14.2	.9744498	18 15.8	14 12 57.2	2 27 58.6	.97
8	1 19 16.21	5 42 57.8	.9736873	18 12.1	14 15 1.6	2 27 59.3	.97
9	1 19 25.95	5 43 39.2	.9729225	18 8.3	14 17 5.9	2 28 0.1	.97
10	1 19 35.33	5 44 18.4	.9721556	18 4.5	14 19 10.3	2 28 0.9	.97
11	1 19 44.35	5 44 55.3	.9713868	18 0.7	14 21 14.7	2 28 1.6	.97
12	1 19 53.01	5 45 30.0	.9706164	17 56.9	14 23 19.1	2 28 2.4	.97
13	1 20 1.30	5 46 2.4	.9698444	17 53.1	14 25 23.5	2 28 3.1	.97
14	1 20 9.23	5 46 32.6	.9690711	17 49.3	14 27 27.9	2 28 3.9	.97
15	1 20 16.80	5 47 0.4	.9682967	17 45.5	14 29 32.3	2 28 4.6	.97
16	1 20 23.99	5 47 26.0	.9675214	17 41.7	14 31 36.7	2 28 5.3	.97
17	1 20 30.81	5 47 49.3	.9667454	17 37.9	14 33 41.1	2 28 6.1	.97
18	1 20 37.26	5 48 10.2	.9659688	17 34.0	14 35 45.5	2 28 6.8	.97
19	1 20 43.34	5 48 28.9	.9651919	17 30.2	14 37 50.0	2 28 7.5	.97
20	1 20 49.05	5 48 45.3	.9644150	17 26.4	14 39 54.4	2 28 8.3	.97
21	1 20 54.38	5 48 59.4	.9636381	17 22.5	14 41 58.8	2 28 9.0	.97
22	1 20 59.33	5 49 11.2	.9628615	17 18.7	14 44 3.3	2 28 9.7	.97
23	1 21 3.91	5 49 20.7	.9620855	17 14.8	14 46 7.8	2 28 10.4	.97
24	1 21 8.10	5 49 27.9	.9613101	17 10.9	14 48 12.2	2 28 11.1	.97
25	1 21 11.92	5 49 32.9	.9605357	17 7.1	14 50 16.7	2 28 11.8	.97
26	1 21 15.36	5 49 35.5	.9597623	17 3.2	14 52 21.2	2 28 12.5	.97
27	1 21 18.41	5 49 35.8	.9589903	16 59.3	14 54 25.7	2 28 13.2	.97
28	1 21 21.08	5 49 33.8	.9582198	16 55.4	14 56 30.2	2 28 13.9	.97
29	1 21 23.37	5 49 29.5	.9574510	16 51.5	14 58 34.7	2 28 14.6	.97
30	1 21 25.27	5 49 22.9	.9566842	16 47.6	15 0 39.2	2 28 15.3	.97
31	1 21 26.78	5 49 14.0	.9559196	16 43.7	15 2 43.7	2 28 16.0	.97
32	1 21 27.90	N. 5 49 2.8	0.9551574	16 39.8	15 4 48.2	S. 2 28 16.7	0.97



JULY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>m</sup> 18 <sup>s</sup> 7 <sup>77</sup>	+ 0 <sup>s</sup> 50	0 <sup>s</sup> 57	N. 5 <sup>o</sup> 37 <sup>i</sup> 50 <sup>n</sup> 6	+ 2 <sup>h</sup> 3	7 <sup>h</sup> 9	0 <sup>h</sup> 9
18 19 <sup>63</sup>	0 <sup>s</sup> 49	0 <sup>s</sup> 57	5 38 45 <sup>5</sup>	2 <sup>h</sup> 2	7 <sup>h</sup> 9	0 <sup>h</sup> 9
18 31 <sup>16</sup>	0 <sup>s</sup> 47	0 <sup>s</sup> 58	5 39 38 <sup>3</sup>	2 <sup>h</sup> 2	8 <sup>h</sup> 0	0 <sup>h</sup> 9
18 42 <sup>34</sup>	0 <sup>s</sup> 46	0 <sup>s</sup> 58	5 40 28 <sup>9</sup>	2 <sup>h</sup> 1	8 <sup>h</sup> 0	0 <sup>h</sup> 9
18 53 <sup>19</sup>	0 <sup>s</sup> 44	0 <sup>s</sup> 58	5 41 17 <sup>4</sup>	2 <sup>h</sup> 0	8 <sup>h</sup> 0	0 <sup>h</sup> 9
19 3 <sup>68</sup>	0 <sup>s</sup> 43	0 <sup>s</sup> 58	5 42 3 <sup>6</sup>	1 <sup>h</sup> 9	8 <sup>h</sup> 0	0 <sup>h</sup> 9
19 13 <sup>83</sup>	0 <sup>s</sup> 42	0 <sup>s</sup> 58	5 42 47 <sup>6</sup>	1 <sup>h</sup> 8	8 <sup>h</sup> 0	0 <sup>h</sup> 9
19 23 <sup>63</sup>	0 <sup>s</sup> 40	0 <sup>s</sup> 58	5 43 29 <sup>4</sup>	1 <sup>h</sup> 7	8 <sup>h</sup> 0	0 <sup>h</sup> 9
19 33 <sup>07</sup>	0 <sup>s</sup> 39	0 <sup>s</sup> 58	5 44 9 <sup>0</sup>	1 <sup>h</sup> 6	8 <sup>h</sup> 0	0 <sup>h</sup> 9
19 42 <sup>16</sup>	0 <sup>s</sup> 37	0 <sup>s</sup> 58	5 44 46 <sup>4</sup>	1 <sup>h</sup> 5	8 <sup>h</sup> 1	0 <sup>h</sup> 9
19 50 <sup>89</sup>	0 <sup>s</sup> 36	0 <sup>s</sup> 58	5 45 21 <sup>6</sup>	1 <sup>h</sup> 4	8 <sup>h</sup> 1	0 <sup>h</sup> 9
19 59 <sup>25</sup>	0 <sup>s</sup> 34	0 <sup>s</sup> 58	5 45 54 <sup>5</sup>	1 <sup>h</sup> 3	8 <sup>h</sup> 1	0 <sup>h</sup> 9
20 7 <sup>25</sup>	0 <sup>s</sup> 33	0 <sup>s</sup> 58	5 46 25 <sup>1</sup>	1 <sup>h</sup> 2	8 <sup>h</sup> 1	0 <sup>h</sup> 9
20 14 <sup>89</sup>	0 <sup>s</sup> 31	0 <sup>s</sup> 58	5 46 53 <sup>5</sup>	1 <sup>h</sup> 1	8 <sup>h</sup> 1	0 <sup>h</sup> 9
20 22 <sup>16</sup>	0 <sup>s</sup> 30	0 <sup>s</sup> 58	5 47 19 <sup>6</sup>	1 <sup>h</sup> 0	8 <sup>h</sup> 1	0 <sup>h</sup> 9
20 29 <sup>06</sup>	0 <sup>s</sup> 28	0 <sup>s</sup> 58	5 47 43 <sup>4</sup>	0 <sup>h</sup> 9	8 <sup>h</sup> 2	0 <sup>h</sup> 9
20 35 <sup>59</sup>	0 <sup>s</sup> 26	0 <sup>s</sup> 58	5 48 4 <sup>9</sup>	0 <sup>h</sup> 9	8 <sup>h</sup> 2	0 <sup>h</sup> 9
20 41 <sup>75</sup>	0 <sup>s</sup> 25	0 <sup>s</sup> 58	5 48 24 <sup>1</sup>	0 <sup>h</sup> 8	8 <sup>h</sup> 2	0 <sup>h</sup> 9
20 47 <sup>54</sup>	0 <sup>s</sup> 23	0 <sup>s</sup> 58	5 48 41 <sup>1</sup>	0 <sup>h</sup> 7	8 <sup>h</sup> 2	0 <sup>h</sup> 9
20 52 <sup>96</sup>	0 <sup>s</sup> 22	0 <sup>s</sup> 58	5 48 55 <sup>8</sup>	0 <sup>h</sup> 6	8 <sup>h</sup> 2	0 <sup>h</sup> 9
20 58 <sup>00</sup>	0 <sup>s</sup> 20	0 <sup>s</sup> 58	5 49 8 <sup>2</sup>	0 <sup>h</sup> 5	8 <sup>h</sup> 2	0 <sup>h</sup> 9
21 2 <sup>67</sup>	0 <sup>s</sup> 19	0 <sup>s</sup> 58	5 49 18 <sup>3</sup>	0 <sup>h</sup> 4	8 <sup>h</sup> 2	0 <sup>h</sup> 9
21 6 <sup>96</sup>	0 <sup>s</sup> 17	0 <sup>s</sup> 59	5 49 26 <sup>1</sup>	0 <sup>h</sup> 3	8 <sup>h</sup> 3	0 <sup>h</sup> 9
21 10 <sup>88</sup>	0 <sup>s</sup> 16	0 <sup>s</sup> 59	5 49 31 <sup>7</sup>	0 <sup>h</sup> 2	8 <sup>h</sup> 3	0 <sup>h</sup> 9
21 14 <sup>41</sup>	0 <sup>s</sup> 14	0 <sup>s</sup> 59	5 49 35 <sup>0</sup>	+ 0 <sup>h</sup> 1	8 <sup>h</sup> 3	0 <sup>h</sup> 9
21 17 <sup>57</sup>	0 <sup>s</sup> 12	0 <sup>s</sup> 59	5 49 35 <sup>9</sup>	0 <sup>h</sup> 0	8 <sup>h</sup> 3	0 <sup>h</sup> 9
21 20 <sup>34</sup>	0 <sup>s</sup> 11	0 <sup>s</sup> 59	5 49 34 <sup>6</sup>	- 0 <sup>h</sup> 1	8 <sup>h</sup> 3	0 <sup>h</sup> 9
21 22 <sup>73</sup>	0 <sup>s</sup> 09	0 <sup>s</sup> 59	5 49 31 <sup>0</sup>	0 <sup>h</sup> 2	8 <sup>h</sup> 3	0
21 21 <sup>74</sup>	0 <sup>s</sup> 08	0 <sup>s</sup> 60	5 49 25 <sup>1</sup>	0 <sup>h</sup> 3	8 <sup>h</sup> 3	0
21 26 <sup>37</sup>	0 <sup>s</sup> 06	0 <sup>s</sup> 60	5 49 16 <sup>9</sup>	0 <sup>h</sup> 4	8 <sup>h</sup> 3	0
21 27 <sup>60</sup>	0 <sup>s</sup> 04	0 <sup>s</sup> 60	5 49 6 <sup>4</sup>	0 <sup>h</sup> 5	8 <sup>h</sup> 3	0
21 28 <sup>45</sup>	+ 0 <sup>s</sup> 03	0 <sup>s</sup> 60	N. 5 48 53 <sup>7</sup>	- 0 <sup>h</sup> 6	8 <sup>h</sup> 3	0

AUGUST, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 21 27.90	N. 5 49 2.8	0.9551574	16 39.8	15 4 48.2 S.	2 28 16.7	0.9721
2	1 21 28.64	5 48 49.3	.9543979	16 35.9	15 6 52.7	2 28 17.4	.9721
3	1 21 28.98	5 48 33.5	.9536413	16 31.9	15 8 57.3	2 28 18.1	.9721
4	1 21 28.93	5 48 15.4	.9528879	16 28.0	15 11 1.8	2 28 18.7	.9721
5	1 21 28.49	5 47 55.0	.9521379	16 24.0	15 13 6.4	2 28 19.4	.9721
6	1 21 27.67	5 47 32.3	.9513916	16 20.1	15 15 10.9	2 28 20.1	.9721
7	1 21 26.45	5 47 7.4	.9506492	16 16.1	15 17 15.5	2 28 20.7	.9721
8	1 21 24.84	5 46 40.2	.9499111	16 12.2	15 19 20.1	2 28 21.4	.9721
9	1 21 22.85	5 46 10.7	.9491774	16 8.2	15 21 24.6	2 28 22.1	.9721
10	1 21 20.47	5 45 39.0	.9484485	16 4.2	15 23 29.2	2 28 22.7	.9721
11	1 21 17.71	5 45 5.1	.9477246	16 0.2	15 25 33.8	2 28 23.4	.9721
12	1 21 14.56	5 44 28.9	.9470059	15 56.2	15 27 38.4	2 28 24.0	.9721
13	1 21 11.03	5 43 50.6	.9462927	15 52.2	15 29 43.0	2 28 24.7	.9711
14	1 21 7.13	5 43 10.1	.9455852	15 48.2	15 31 47.6	2 28 25.3	.9711
15	1 21 2.84	5 42 27.4	.9448838	15 44.2	15 33 52.2	2 28 25.9	.9711
16	1 20 58.18	5 41 42.6	.9441886	15 40.2	15 35 56.9	2 28 26.6	.9711
17	1 20 53.14	5 40 55.6	.9435000	15 36.2	15 38 1.5	2 28 27.2	.9711
18	1 20 47.74	5 40 6.6	.9428180	15 32.2	15 40 6.1	2 28 27.8	.9711
19	1 20 41.96	5 39 15.4	.9421431	15 28.2	15 42 10.8	2 28 28.5	.9711
20	1 20 35.82	5 38 22.2	.9414753	15 24.1	15 44 15.4	2 28 29.1	.9711
21	1 20 29.32	5 37 26.9	.9408150	15 20.1	15 46 20.1	2 28 29.7	.9711
22	1 20 22.46	5 36 29.6	.9401624	15 16.0	15 48 24.8	2 28 30.3	.9711
23	1 20 15.23	5 35 30.3	.9395177	15 12.0	15 50 29.4	2 28 30.9	.9711
24	1 20 7.65	5 34 29.0	.9388812	15 7.9	15 52 34.1	2 28 31.5	.9711
25	1 19 59.72	5 33 25.8	.9382531	15 3.9	15 54 38.8	2 28 32.1	.9711
26	1 19 51.45	5 32 20.6	.9376336	14 59.8	15 56 43.4	2 28 32.8	.9711
27	1 19 42.82	5 31 13.6	.9370229	14 55.7	15 58 48.1	2 28 33.4	.9711
28	1 19 33.85	5 30 4.7	.9364213	14 51.6	16 0 52.8	2 28 33.9	.9711
29	1 19 24.55	5 28 53.9	.9358290	14 47.5	16 2 57.5	2 28 34.5	.9711
30	1 19 14.91	5 27 41.4	.9352463	14 43.4	16 5 2.3	2 28 35.1	.9711
31	1 19 4.94	5 26 27.0	.9346735	14 39.3	16 7 7.0	2 28 35.7	.9711
32	1 18 54.64	N. 5 25 10.9	0.9341109	14 35.2	16 9 11.7 S.	2 28 36.3	0.9711



## AUGUST, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
	1 21 28.45	+ 0.03	0.60	N. 5 48 53.7	- 0.6	8.3	1.0
	1 21 28.92	+ 0.01	0.60	5 48 38.6	0.7	8.3	1.0
	1 21 28.99	- 0.01	0.60	5 48 21.3	0.8	8.3	1.0
	1 21 28.68	0.02	0.60	5 48 1.7	0.9	8.3	1.0
	1 21 27.97	0.04	0.61	5 47 39.8	1.0	8.4	1.0
	1 21 26.88	0.05	0.61	5 47 15.6	1.1	8.4	1.0
	1 21 25.40	0.07	0.61	5 46 49.2	1.1	8.4	1.0
	1 21 23.54	0.08	0.61	5 46 20.5	1.2	8.4	1.0
	1 21 21.29	0.10	0.61	5 45 49.6	1.3	8.4	1.0
	1 21 18.66	0.12	0.61	5 45 16.5	1.4	8.4	1.0
	1 21 15.65	0.13	0.61	5 44 41.2	1.5	8.5	1.0
	1 21 12.26	0.15	0.61	5 44 3.7	1.6	8.5	1.0
	1 21 8.49	0.16	0.61	5 43 24.0	1.7	8.5	1.0
	1 21 4.35	0.18	0.61	5 42 42.2	1.8	8.5	1.0
	1 20 59.83	0.20	0.61	5 41 58.3	1.9	8.5	1.0
	1 20 54.93	0.21	0.61	5 41 12.2	2.0	8.5	1.0
	1 20 49.67	0.23	0.61	5 40 24.0	2.1	8.5	1.0
	1 20 44.04	0.24	0.62	5 39 33.7	2.1	8.6	1.0
	1 20 38.05	0.26	0.62	5 38 41.3	2.2	8.6	1.0
	1 20 31.69	0.27	0.62	5 37 46.9	2.3	8.6	1.0
	1 20 24.97	0.29	0.62	5 36 50.5	2.4	8.6	1.0
	1 20 17.90	0.30	0.62	5 35 52.1	2.5	8.6	1.0
	1 20 10.48	0.32	0.62	5 34 51.7	2.6	8.6	1.0
	1 20 2.70	0.33	0.62	5 33 49.4	2.6	8.6	1.0
	1 19 54.57	0.35	0.62	5 32 45.1	2.7	8.7	1.0
	1 19 46.10	0.36	0.62	5 31 39.0	2.8	8.7	1.0
	1 19 37.29	0.37	0.62	5 30 31.0	2.9	8.7	1.0
	1 19 28.13	0.39	0.62	5 29 21.1	3.0	8.7	1.0
	1 19 18.65	0.40	0.62	5 28 9.4	3.0	8.7	1.0
	1 19 8.83	0.42	0.62	5 26 56.0	3.1	8.7	1.0
	1 18 58.69	0.43	0.62	5 25 40.8	3.2	8.7	1.0
	1 18 48.22	- 0.44	0.62	N. 5 24 23.8	- 3.2	8.7	1.0

# SEPTEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1	1 18 54.64	N. 5 25 10.9	0.9341109	14 35.2	16 9 11.7 S.	2 28 36.3	0.9717242
2	1 18 44.02	5 23 53.0	.9335586	14 31.1	16 11 16.4	2 28 36.9	.9717103
3	1 18 33.08	5 22 33.4	.9330170	14 27.0	16 13 21.2	2 28 37.5	.9716964
4	1 18 21.83	5 21 12.2	.9324864	14 22.9	16 15 25.9	2 28 38.0	.9716826
5	1 18 10.28	5 19 49.3	.9319668	14 18.8	16 17 30.7	2 28 38.6	.9716687
6	1 17 58.42	5 18 24.8	.9314587	14 14.6	16 19 35.4	2 28 39.2	.9716548
7	1 17 46.26	5 16 58.8	.9309622	14 10.5	16 21 40.2	2 28 39.7	.9716409
8	1 17 33.82	5 15 31.3	.9304775	14 6.4	16 23 45.0	2 28 40.3	.9716270
9	1 17 21.09	5 14 2.3	.9300049	14 2.2	16 25 49.8	2 28 40.9	.9716132
10	1 17 8.09	5 12 31.9	.9295445	13 58.1	16 27 54.6	2 28 41.4	.9715993
11	1 16 54.82	5 11 0.1	.9290967	13 53.9	16 29 59.4	2 28 42.0	.9715854
12	1 16 41.29	5 9 27.0	.9286616	13 49.7	16 32 4.2	2 28 42.5	.9715715
13	1 16 27.50	5 7 52.6	.9282393	13 45.6	16 34 9.0	2 28 43.1	.9715577
14	1 16 13.47	5 6 17.0	.9278302	13 41.4	16 36 13.8	2 28 43.6	.9715438
15	1 15 59.20	5 4 40.2	.9274341	13 37.2	16 38 18.6	2 28 44.2	.9715300
16	1 15 44.70	5 3 2.3	.9270520	13 33.1	16 40 23.5	2 28 44.7	.9715161
17	1 15 29.97	5 1 23.3	.9266832	13 28.9	16 42 28.3	2 28 45.2	.9715022
18	1 15 15.03	4 59 43.3	.9263282	13 24.7	16 44 33.2	2 28 45.8	.9714884
19	1 14 59.87	4 58 2.3	.9259871	13 20.5	16 46 38.0	2 28 46.3	.9714745
20	1 14 44.51	4 56 20.4	.9256601	13 16.3	16 48 42.9	2 28 46.8	.9714607
21	1 14 28.95	4 54 37.6	.9253472	13 12.1	16 50 47.8	2 28 47.3	.9714469
22	1 14 13.21	4 52 53.9	.9250486	13 7.9	16 52 52.7	2 28 47.8	.9714330
23	1 13 57.29	4 51 9.5	.9247645	13 3.8	16 54 57.6	2 28 48.4	.9714192
24	1 13 41.20	4 49 24.3	.9244950	12 59.6	16 57 2.5	2 28 48.9	.9714054
25	1 13 24.94	4 47 38.5	.9242403	12 55.3	16 59 7.4	2 28 49.4	.9713915
26	1 13 8.53	4 45 52.0	.9240006	12 51.1	17 1 12.3	2 28 49.9	.9713777
27	1 12 51.97	4 44 4.9	.9237759	12 46.9	17 3 17.2	2 28 50.4	.9713639
28	1 12 35.27	4 42 17.3	.9235664	12 42.7	17 5 22.2	2 28 50.9	.9713500
29	1 12 18.44	4 40 29.3	.9233722	12 38.5	17 7 27.1	2 28 51.4	.9713362
30	1 12 1.49	4 38 40.8	.9231935	12 34.3	17 9 32.1	2 28 51.9	.9713224
31	1 11 44.43	N. 4 36 51.9	0.9230303	12 30.1	17 11 37.0 S.	2 28 52.3	0.9713086



## SEPTEMBER, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	1 18 48.22	— 0.44	0.62	N. 5 24 23.8	— 3.2	8.7	1.0
2	1 18 37.44	0.46	0.63	5 23 5.1	3.3	8.8	1.0
3	1 18 26.34	0.47	0.63	5 21 44.7	3.4	8.8	1.0
4	1 18 14.94	0.48	0.63	5 20 22.7	3.5	8.8	1.0
5	1 18 3.24	0.49	0.63	5 18 59.1	3.5	8.8	1.0
6	1 17 51.24	0.51	0.63	5 17 31.0	3.6	8.8	1.0
7	1 17 38.95	0.52	0.63	5 16 7.3	3.6	8.8	1.0
8	1 17 26.37	0.53	0.63	5 14 39.2	3.7	8.8	1.0
9	1 17 13.52	0.54	0.63	5 13 9.6	3.8	8.8	1.0
10	1 17 0.40	0.55	0.63	5 11 38.6	3.8	8.8	1.0
11	1 16 47.02	0.56	0.64	5 10 6.3	3.9	8.9	1.0
12	1 16 33.38	0.57	0.64	5 8 32.7	3.9	8.9	1.0
13	1 16 19.49	0.58	0.64	5 6 57.9	4.0	8.9	1.0
14	1 16 5.36	0.59	0.64	5 5 21.9	4.0	8.9	1.0
15	1 15 51.00	0.60	0.64	5 3 44.8	4.1	8.9	1.0
16	1 15 36.41	0.61	0.64	5 2 6.6	4.1	8.9	1.0
17	1 15 21.60	0.62	0.64	5 0 27.3	4.2	8.9	1.0
18	1 15 6.58	0.63	0.64	4 58 47.0	4.2	8.9	1.0
19	1 14 51.36	0.64	0.64	4 57 5.8	4.2	8.9	1.0
20	1 14 35.93	0.65	0.64	4 55 23.7	4.3	8.9	1.0
21	1 14 20.32	0.65	0.64	4 53 40.7	4.3	8.9	1.0
22	1 14 4.52	0.66	0.64	4 51 56.9	4.3	8.9	1.0
23	1 13 48.55	0.67	0.65	4 50 12.4	4.4	9.0	1.0
24	1 13 32.42	0.68	0.65	4 48 27.2	4.4	9.0	1.0
25	1 13 16.12	0.69	0.65	4 46 41.3	4.4	9.0	1.0
26	1 12 59.68	0.69	0.65	4 44 54.8	4.5	9.0	1.0
27	1 12 43.09	0.69	0.65	4 43 7.7	4.5	9.0	1.0
28	1 12 26.37	0.70	0.65	4 41 20.1	4.5	9.0	1.0
29	1 12 9.53	0.70	0.65	4 39 32.1	4.5	9.0	1.0
30	1 11 52.57	0.71	0.65	4 37 43.8	4.5	9.0	1.0
31	1 11 35.50	— 0.71	0.65	N. 4 35 55.1	— 4.5	9.0	1.0

## OCTOBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.					
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V.			
								Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>				
1	1 11 44.43	N. 4 36 51.9	0.9230303	12 30.1	17 11 37.0	S. 2 28 52.3	0.9712			
2	1 11 27.26	4 35 2.8	.9228827	12 25.9	17 13 42.0	2 28 52.8	.9712			
3	1 11 10.00	4 33 13.4	.9227509	12 21.7	17 15 47.0	2 28 53.3	.9712			
4	1 10 52.65	4 31 23.9	.9226350	12 17.4	17 17 51.9	2 28 53.8	.9712			
5	1 10 35.23	4 29 34.3	.9225349	12 13.2	17 19 56.9	2 28 54.2	.9712			
6	1 10 17.75	4 27 44.6	.9224508	12 9.0	17 22 1.9	2 28 54.7	.9712			
7	1 10 0.21	4 25 54.9	.9223828	12 4.8	17 24 7.0	2 28 55.2	.9712			
8	1 9 42.63	4 24 5.3	.9223308	12 0.5	17 26 12.0	2 28 55.7	.9712			
9	1 9 25.02	4 22 15.9	.9222949	11 56.3	17 28 17.0	2 28 56.1	.9712			
10	1 9 7.38	4 20 26.6	.9222752	11 52.1	17 30 22.1	2 28 56.6	.9712			
11	1 8 49.73	4 18 37.7	.9222716	11 47.9	17 32 27.1	2 28 57.0	.9712			
12	1 8 32.08	4 16 49.0	.9222841	11 43.6	17 34 32.2	2 28 57.5	.9712			
13	1 8 14.43	4 15 0.8	.9223127	11 39.4	17 36 37.2	2 28 57.9	.9712			
14	1 7 56.80	4 13 13.0	.9223574	11 35.2	17 38 42.3	2 28 58.4	.9712			
15	1 7 39.20	4 11 25.7	.9224182	11 31.0	17 40 47.4	2 28 58.8	.9712			
16	1 7 21.63	4 9 39.0	.9224950	11 26.7	17 42 52.5	2 28 59.3	.9712			
17	1 7 4.11	4 7 52.9	.9225878	11 22.5	17 44 57.6	2 28 59.7	.9712			
18	1 6 46.65	4 6 7.5	.9226965	11 18.3	17 47 2.7	2 29 0.1	.9712			
19	1 6 29.25	4 4 22.8	.9228210	11 14.1	17 49 7.8	2 29 0.6	.9712			
20	1 6 11.92	4 2 38.9	.9229614	11 9.9	17 51 12.9	2 29 1.0	.9712			
21	1 5 54.67	4 0 55.9	.9231174	11 5.7	17 53 18.0	2 29 1.4	.9712			
22	1 5 37.51	3 59 13.8	.9232891	11 1.4	17 55 23.2	2 29 1.8	.9712			
23	1 5 20.46	3 57 32.6	.9234764	10 57.2	17 57 28.3	2 29 2.3	.9712			
24	1 5 3.52	3 55 52.5	.9236792	10 53.0	17 59 33.5	2 29 2.7	.9712			
25	1 4 46.69	3 54 13.5	.9238975	10 48.8	18 1 38.7	2 29 3.1	.9712			
26	1 4 29.99	3 52 35.6	.9241311	10 44.6	18 3 43.9	2 29 3.5	.9712			
27	1 4 13.43	3 50 58.9	.9243800	10 40.4	18 5 49.1	2 29 3.9	.9712			
28	1 3 57.01	3 49 23.4	.9246440	10 36.2	18 7 54.3	2 29 4.3	.9712			
29	1 3 40.74	3 47 49.2	.9249232	10 32.0	18 9 59.5	2 29 4.7	.9712			
30	1 3 24.64	3 46 16.3	.9252172	10 27.8	18 12 4.7	2 29 5.1	.9712			
31	1 3 8.71	3 44 44.8	.9255261	10 23.6	18 14 9.9	2 29 5.5	.9712			
32	1 2 52.97	N. 3 43 14.8	0.9258497	10 19.4	18 16 15.2	S. 2 29 5.9	0.9712			



# SATURN.

OCTOBER, 1850.

At Transit over the Meridian of Greenwich.

Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
<sup>h</sup> <sup>m</sup> <sup>s</sup> 1 11 35.50	<sup>s</sup> - 0.71	<sup>s</sup> 0.65	N. <sup>°</sup> <sup>'</sup> <sup>"</sup> 4 35 55.1	<sup>"</sup> - 4.5	<sup>"</sup> 9.0	<sup>"</sup> 1.0
1 11 18.33	0.71	0.65	4 34 6.2	4.5	9.0	1.0
1 11 1.08	0.72	0.65	4 32 17.0	4.6	9.0	1.0
1 10 43.74	0.72	0.65	4 30 27.7	4.6	9.0	1.0
1 10 26.34	0.73	0.65	4 28 38.4	4.6	9.0	1.0
1 10 8.88	0.73	0.65	4 26 49.0	4.6	9.0	1.0
1 9 51.37	0.73	0.65	4 24 59.7	4.6	9.0	1.0
1 9 33.82	0.73	0.65	4 23 10.5	4.5	9.0	1.0
1 9 16.24	0.73	0.65	4 21 21.5	4.5	9.0	1.0
1 8 58.65	0.73	0.65	4 19 32.7	4.5	9.0	1.0
1 8 41.05	0.73	0.65	4 17 44.2	4.5	9.0	1.0
1 8 23.45	0.73	0.65	4 15 56.1	4.5	9.0	1.0
1 8 5.86	0.73	0.65	4 14 8.4	4.5	9.0	1.0
1 7 48.30	0.73	0.65	4 12 21.1	4.5	9.0	1.0
1 7 30.76	0.73	0.65	4 10 34.1	4.4	9.0	1.0
1 7 13.27	0.73	0.65	4 8 48.3	4.4	9.0	1.0
1 6 55.83	0.73	0.65	4 7 2.8	4.4	9.0	1.0
1 6 38.44	0.72	0.65	4 5 18.1	4.4	9.0	1.0
1 6 21.12	0.72	0.65	4 3 34.1	4.3	9.0	1.0
1 6 3.88	0.72	0.65	4 1 50.9	4.3	9.0	1.0
1 5 46.73	0.71	0.65	4 0 8.6	4.2	9.0	1.0
1 5 29.67	0.71	0.65	3 58 27.2	4.2		
1 5 12.71	0.70	0.65	3 56 46.8	4.2		
1 4 55.87	0.70	0.65	3 55 7.5	4.1		
1 4 39.15	0.69	0.65	3 53 29.2	4.1		
1 4 22.56	0.69	0.65	3 51 52.1	4.0		
1 4 6.10	0.68	0.65	3 50 16.2	4.0		
1 3 49.80	0.68	0.64	3 48 41.6	3		
1 3 33.66	0.67	0.64	3 47 8.2	3		
1 3 17.68	0.66	0.64	3 45 36.2	3		
1 3 1.87	0.65	0.64	3 44 5.6			
1 2 46.25	- 0.65	0.64	N. 3 42 36.5	-		

## NOVEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1	h m s 1 2 52.97	N. 3 43 14.8	0.9258497	10 19.4	18 16 15.2	S. 2 29 5.9	0.970
2	1 2 37.42	3 41 46.3	.9261879	10 15.2	18 18 20.4	2 29 6.3	.970
3	1 2 22.06	3 40 19.4	.9265404	10 11.0	18 20 25.7	2 29 6.6	.970
4	1 2 6.92	3 38 54.1	.9269072	10 6.9	18 22 30.9	2 29 7.0	.970
5	1 1 51.99	3 37 30.4	.9272881	10 2.7	18 24 36.2	2 29 7.4	.970
6	1 1 37.30	3 36 8.5	.9276829	9 58.5	18 26 41.5	2 29 7.8	.970
7	1 1 22.83	3 34 48.3	.9280913	9 54.3	18 28 46.8	2 29 8.1	.970
8	1 1 8.61	3 33 30.0	.9285132	9 50.2	18 30 52.1	2 29 8.5	.970
9	1 0 54.64	3 32 13.5	.9289485	9 46.0	18 32 57.4	2 29 8.9	.970
10	1 0 40.93	3 30 58.9	.9293967	9 41.9	18 35 2.7	2 29 9.2	.970
11	1 0 27.48	3 29 46.2	.9298578	9 37.7	18 37 8.0	2 29 9.6	.970
12	1 0 14.30	3 28 35.5	.9303315	9 33.6	18 39 13.4	2 29 9.9	.970
13	1 0 1.41	3 27 26.8	.9308176	9 29.4	18 41 18.7	2 29 10.3	.970
14	0 59 48.80	3 26 20.1	.9313158	9 25.3	18 43 24.1	2 29 10.6	.970
15	0 59 36.49	3 25 15.6	.9318259	9 21.1	18 45 29.5	2 29 11.0	.970
16	0 59 24.47	3 24 13.1	.9323476	9 17.0	18 47 34.8	2 29 11.3	.970
17	0 59 12.75	3 23 12.8	.9328808	9 12.9	18 49 40.2	2 29 11.6	.970
18	0 59 1.35	3 22 14.6	.9334252	9 8.8	18 51 45.6	2 29 12.0	.970
19	0 58 50.26	3 21 18.7	.9339805	9 4.6	18 53 51.0	2 29 12.3	.970
20	0 58 39.49	3 20 25.0	.9345465	9 0.5	18 55 56.4	2 29 12.6	.970
21	0 58 29.05	3 19 33.6	.9351230	8 56.4	18 58 1.8	2 29 12.9	.970
22	0 58 18.93	3 18 44.4	.9357098	8 52.3	19 0 7.3	2 29 13.3	.970
23	0 58 9.16	3 17 57.6	.9363066	8 48.3	19 2 12.7	2 29 13.6	.970
24	0 57 59.72	3 17 13.2	.9369132	8 44.2	19 4 18.2	2 29 13.9	.970
25	0 57 50.63	3 16 31.1	.9375293	8 40.1	19 6 23.6	2 29 14.2	.970
26	0 57 41.89	3 15 51.4	.9381548	8 36.0	19 8 29.1	2 29 14.5	.970
27	0 57 33.50	3 15 14.1	.9387894	8 31.9	19 10 34.6	2 29 14.8	.970
28	0 57 25.48	3 14 39.3	.9394327	8 27.9	19 12 40.0	2 29 15.1	.970
29	0 57 17.82	3 14 7.0	.9400846	8 23.8	19 14 45.5	2 29 15.4	.970
30	0 57 10.53	3 13 37.1	.9407448	8 19.8	19 16 51.0	2 29 15.7	.970
31	0 57 3.61	N. 3 13 9.7	0.9414129	8 15.7	19 18 56.6	S. 2 29 16.0	0.970



## NOVEMBER, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1 2 46.25	— 0.65	0.64	N. 3 42 36.5	— 3.7	8.9	1.0
1 2 30.83	0.64	0.64	3 41 9.0	3.6	8.9	1.0
1 2 15.61	0.63	0.64	3 39 43.0	3.6	8.9	1.0
1 2 0.60	0.62	0.64	3 38 18.6	3.5	8.9	1.0
1 1 45.81	0.61	0.64	3 36 53.9	3.4	8.9	1.0
1 1 31.25	0.60	0.64	3 35 34.9	3.3	8.9	1.0
1 1 16.93	0.59	0.64	3 34 15.7	3.3	8.9	1.0
1 1 2.85	0.58	0.64	3 32 58.4	3.2	8.9	1.0
1 0 49.03	0.57	0.64	3 31 42.9	3.1	8.9	1.0
1 0 35.46	0.56	0.63	3 30 29.3	3.0	8.8	1.0
1 0 22.16	0.55	0.63	3 29 17.6	2.9	8.8	1.0
1 0 9.14	0.54	0.63	3 28 7.9	2.9	8.8	1.0
0 59 56.39	0.53	0.63	3 27 0.2	2.8	8.8	1.0
0 59 43.93	0.51	0.63	3 25 54.6	2.7	8.8	1.0
0 59 31.77	0.50	0.63	3 24 51.0	2.6	8.8	1.0
0 59 19.90	0.49	0.63	3 23 49.5	2.5	8.8	1.0
0 59 8.34	0.48	0.63	3 22 50.2	2.4	8.8	1.0
0 58 57.09	0.46	0.63	3 21 53.1	2.3	8.8	1.0
0 58 46.15	0.45	0.63	3 20 58.1	2.2	8.7	1.0
0 58 35.53	0.44	0.63	3 20 5.4	2.1	8.7	1.0
0 58 25.24	0.42	0.63	3 19 15.0	2.1	8.7	1.0
0 58 15.28	0.41	0.63	3 18 26.9	2.0	8.7	1.0
0 58 5.65	0.39	0.63	3 17 41.1	1.9	8.7	1.0
0 57 56.37	0.38	0.63	3 16 57.6	1.8	8.7	1.0
0 57 47.43	0.37	0.63	3 16 16.5	1.7	8.7	1.0
0 57 38.84	0.35	0.62	3 15 37.8	1.6	8.6	1.0
0 57 30.61	0.34	0.62	3 15 1.5	1.5	8.6	1.0
0 57 22.74	0.32	0.62	3 14 27.6	1.4	8.6	1.0
0 57 15.23	0.31	0.62	3 13 56.2	1.3	8.6	1.0
0 57 8.08	0.29	0.62	3 13 27.3	1.2	8.6	1.0
0 57 1.31	— 0.27	0.62	N. 3 13 0.9	— 1.1	8.6	1.0

## DECEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	0 57 3.61	N. 3 13 9.7	0.9414129	8 15.7	19 18 56.6	S. 2 29 16.0	0.970
2	0 56 57.07	3 12 44.8	.9420888	8 11.7	19 21 2.1	2 29 16.3	.970
3	0 56 50.91	3 12 22.5	.9427721	8 7.6	19 23 7.6	2 29 16.5	.970
4	0 56 45.13	3 12 2.7	.9434625	8 3.6	19 25 13.1	2 29 16.8	.970
5	0 56 39.74	3 11 45.5	.9441598	7 59.6	19 27 18.7	2 29 17.1	.970
6	0 56 34.74	3 11 30.9	.9448638	7 55.6	19 29 24.2	2 29 17.4	.970
7	0 56 30.14	3 11 18.8	.9455740	7 51.6	19 31 29.8	2 29 17.6	.970
8	0 56 25.93	3 11 9.3	.9462903	7 47.6	19 33 35.4	2 29 17.9	.970
9	0 56 22.12	3 11 2.5	.9470123	7 43.6	19 35 40.9	2 29 18.2	.970
10	0 56 18.72	3 10 58.2	.9477397	7 39.6	19 37 46.5	2 29 18.4	.970
11	0 56 15.71	3 10 56.6	.9484722	7 35.6	19 39 52.1	2 29 18.7	.970
12	0 56 13.10	3 10 57.6	.9492096	7 31.6	19 41 57.7	2 29 18.9	.970
13	0 56 10.90	3 11 1.2	.9499516	7 27.7	19 44 3.3	2 29 19.2	.970
14	0 56 9.10	3 11 7.4	.9506978	7 23.7	19 46 9.0	2 29 19.4	.970
15	0 56 7.71	3 11 16.3	.9514480	7 19.8	19 48 14.6	2 29 19.7	.970
16	0 56 6.72	3 11 27.7	.9522020	7 15.8	19 50 20.2	2 29 19.9	.970
17	0 56 6.14	3 11 41.8	.9529594	7 11.9	19 52 25.9	2 29 20.1	.970
18	0 56 5.96	3 11 58.4	.9537202	7 8.0	19 54 31.5	2 29 20.4	.970
19	0 56 6.19	3 12 17.7	.9544839	7 4.0	19 56 37.2	2 29 20.6	.970
20	0 56 6.82	3 12 39.5	.9552504	7 0.1	19 58 42.9	2 29 20.8	.970
21	0 56 7.86	3 13 3.9	.9560194	6 56.2	20 0 48.6	2 29 21.1	.970
22	0 56 9.30	3 13 30.9	.9567907	6 52.3	20 2 54.2	2 29 21.3	.970
23	0 56 11.15	3 14 0.5	.9575640	6 48.4	20 4 59.9	2 29 21.5	.970
24	0 56 13.41	3 14 32.6	.9583390	6 44.5	20 7 5.7	2 29 21.7	.970
25	0 56 16.08	3 15 7.3	.9591156	6 40.6	20 9 11.4	2 29 21.9	.970
26	0 56 19.15	3 15 44.5	.9598935	6 36.8	20 11 17.1	2 29 22.1	.970
27	0 56 22.63	3 16 24.3	.9606724	6 32.9	20 13 22.8	2 29 22.3	.970
28	0 56 26.51	3 17 6.6	.9614520	6 29.0	20 15 28.5	2 29 22.5	.970
29	0 56 30.80	3 17 51.4	.9622322	6 25.1	20 17 34.3	2 29 22.7	.970
30	0 56 35.50	3 18 38.7	.9630127	6 21.3	20 19 40.0	2 29 22.9	.970
31	0 56 40.60	3 19 28.5	.9637932	6 17.4	20 21 45.8	2 29 23.1	.970
32	0 56 46.10	N. 3 20 20.8	0.9645735	6 13.6	20 23 51.6	S. 2 29 23.3	0.970



# SATURN.

DECEMBER, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>H P</i>
<sup>m</sup> <sup>s</sup> 57 1' 31	— 0' 27	0' 62	N. 3 13 0' 9	— 1' 1	8' 6	1
56 54' 92	0' 26	0' 62	3 12 36' 9	1' 0	8' 6	1
56 48' 91	0' 24	0' 62	3 12 15' 5	0' 8	8' 5	1
56 43' 28	0' 23	0' 62	3 11 56' 7	0' 7	8' 5	1
56 38' 03	0' 21	0' 62	3 11 40' 4	0' 6	8' 5	1
56 33' 18	0' 19	0' 62	3 11 26' 6	0' 5	8' 5	1
56 28' 72	0' 18	0' 62	3 11 15' 4	0' 4	8' 5	1
56 24' 65	0' 16	0' 62	3 11 6' 8	0' 3	8' 5	1
56 20' 98	0' 14	0' 62	3 11 0' 8	0' 2	8' 5	1
56 17' 71	0' 13	0' 61	3 10 57' 4	— 0' 1	8' 4	1
56 14' 84	0' 11	0' 61	3 10 56' 7	0' 0	8' 4	1
56 12' 37	0' 09	0' 61	3 10 58' 5	+ 0' 1	8' 4	1
56 10' 30	0' 08	0' 61	3 11 2' 9	0' 2	8' 4	1
56 8' 63	0' 06	0' 61	3 11 9' 9	0' 3	8' 4	1
56 7' 37	0' 04	0' 61	3 11 19' 5	0' 5	8' 4	1
56 6' 50	0' 03	0' 60	3 11 31' 7	0' 6	8' 3	1
56 6' 04	— 0' 01	0' 60	3 11 46' 5	0' 7	8' 3	1
56 5' 99	+ 0' 01	0' 60	3 12 3' 9	0' 8	8' 3	1
56 6' 34	0' 02	0' 60	3 12 23' 9	0' 9	8' 3	1
56 7' 09	0' 04	0' 60	3 12 46' 4	1' 0	8' 3	1
56 8' 24	0' 06	0' 60	3 13 11' 4	1' 1	8' 3	1
56 9' 79	0' 07	0' 60	3 13 39' 1	1' 2	8' 3	1
56 11' 75	0' 09	0' 59	3 14 9' 4	1' 3	8' 3	1
56 14' 12	0' 11	0' 59	3 14 42' 1	1' 4	8	1
56 16' 90	0' 12	0' 59	3 15 17' 4	1' 5		
56 20' 07	0' 14	0' 59	3 15 55' 2	1' 6		
56 23' 65	0' 16	0' 59	3 16 35' 6	1' 7		
56 27' 63	0' 17	0' 59	3 17 18' 4	1' 8		
56 32' 02	0' 19	0' 59	3 18 3' 8	1' 9		
56 36' 81	0' 21	0' 59	3 18 51' 6	2' 0		
56 42' 00	0' 22	0' 59	3 19 42' 0	2' 1		
56 47' 60	+ 0' 24	0' 59	N. 3 20 34' 8	+ 2' 2		

## JANUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad. V
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 23 36.75	N. 8 10 17.5	1.2939691	6 39.4	25 8 40.6	S. 0 34 38.0	1.2988
2	1 23 36.95	8 10 21.1	.2943411	6 35.5	25 9 19.9	0 34 37.6	.2988
3	1 23 37.34	8 10 25.9	.2947140	6 31.5	25 9 59.3	0 34 37.2	.2988
4	1 23 37.93	8 10 31.8	.2950878	6 27.6	25 10 38.7	0 34 36.9	.2988
5	1 23 38.72	8 10 38.8	.2954622	6 23.7	25 11 18.0	0 34 36.5	.2987
6	1 23 39.70	8 10 47.0	.2958372	6 19.8	25 11 57.4	0 34 36.2	.2987
7	1 23 40.88	8 10 56.3	.2962127	6 15.9	25 12 36.8	0 34 35.8	.2987
8	1 23 42.26	8 11 6.8	.2965884	6 12.0	25 13 16.1	0 34 35.5	.2987
9	1 23 43.83	8 11 18.5	.2969644	6 8.1	25 13 55.5	0 34 35.1	.2987
10	1 23 45.60	8 11 31.4	.2973405	6 4.2	25 14 34.9	0 34 34.7	.2987
11	1 23 47.57	8 11 45.4	.2977166	6 0.3	25 15 14.2	0 34 34.4	.2987
12	1 23 49.73	8 12 0.6	.2980925	5 56.4	25 15 53.6	0 34 34.0	.2987
13	1 23 52.09	8 12 17.0	.2984681	5 52.5	25 16 33.0	0 34 33.7	.2987
14	1 23 54.64	8 12 34.5	.2988433	5 48.6	25 17 12.3	0 34 33.3	.2987
15	1 23 57.39	8 12 53.2	.2992181	5 44.7	25 17 51.7	0 34 33.0	.2987
16	1 24 0.33	8 13 13.0	.2995922	5 40.8	25 18 31.1	0 34 32.6	.2987
17	1 24 3.47	8 13 34.0	.2999655	5 37.0	25 19 10.4	0 34 32.2	.2987
18	1 24 6.80	8 13 56.1	.3003379	5 33.1	25 19 49.8	0 34 31.9	.2987
19	1 24 10.32	8 14 19.3	.3007094	5 29.2	25 20 29.1	0 34 31.5	.2987
20	1 24 14.03	8 14 43.6	.3010798	5 25.3	25 21 8.5	0 34 31.2	.2987
21	1 24 17.93	8 15 9.0	.3014489	5 21.5	25 21 47.9	0 34 30.8	.2987
22	1 24 22.02	8 15 35.5	.3018168	5 17.6	25 22 27.2	0 34 30.5	.2987
23	1 24 26.29	8 16 3.1	.3021832	5 13.7	25 23 6.6	0 34 30.1	.2987
24	1 24 30.74	8 16 31.8	.3025482	5 9.9	25 23 46.0	0 34 29.7	.2987
25	1 24 35.38	8 17 1.6	.3029116	5 6.0	25 24 25.3	0 34 29.4	.2987
26	1 24 40.20	8 17 32.5	.3032733	5 2.2	25 25 4.7	0 34 29.0	.2987
27	1 24 45.20	8 18 4.5	.3036331	4 58.3	25 25 44.0	0 34 28.7	.2987
28	1 24 50.39	8 18 37.5	.3039911	4 54.5	25 26 23.4	0 34 28.3	.2987
29	1 24 55.75	8 19 11.5	.3043471	4 50.7	25 27 2.7	0 34 27.9	.2987
30	1 25 1.29	8 19 46.5	.3047010	4 46.8	25 27 42.1	0 34 27.6	.2987
31	1 25 7.01	8 20 22.6	.3050527	4 43.0	25 28 21.4	0 34 27.2	.2987
32	1 25 12.90	N. 8 20 59.7	1.3054021	4 39.1	25 29 0.8	S. 0 34 26.9	1.2988



## JANUARY, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
1	<sup>h</sup> 1 <sup>m</sup> 23 <sup>s</sup> 36.78	+ 0.01	0.13	N. 8 10 18.4	+ 0.1	1.9	0.4
2	1 23 37.04	0.02	0.13	8 10 22.3	0.2	1.9	0.4
3	1 23 37.48	0.02	0.13	8 10 27.3	0.2	1.9	0.4
4	1 23 38.12	0.03	0.13	8 10 33.5	0.3	1.9	0.4
5	1 23 38.96	0.04	0.13	8 10 40.9	0.3	1.9	0.4
6	1 23 39.99	0.05	0.13	8 10 49.3	0.4	1.9	0.4
7	1 23 41.22	0.06	0.13	8 10 58.9	0.4	1.9	0.4
8	1 23 42.65	0.06	0.13	8 11 9.7	0.5	1.9	0.4
9	1 23 44.27	0.07	0.13	8 11 21.7	0.5	1.9	0.4
10	1 23 46.08	0.08	0.13	8 11 34.8	0.6	1.9	0.4
11	1 23 48.09	0.09	0.13	8 11 49.1	0.6	1.9	0.4
12	1 23 50.30	0.10	0.13	8 12 4.5	0.7	1.9	0.4
13	1 23 52.70	0.10	0.13	8 12 21.1	0.7	1.9	0.4
14	1 23 55.29	0.11	0.13	8 12 38.9	0.8	1.9	0.4
15	1 23 58.08	0.12	0.13	8 12 57.8	0.8	1.9	0.4
16	1 24 1.06	0.13	0.13	8 13 17.9	0.9	1.9	0.4
17	1 24 4.23	0.14	0.13	8 13 39.1	0.9	1.9	0.4
18	1 24 7.60	0.14	0.13	8 14 1.3	1.0	1.9	0.4
19	1 24 11.15	0.15	0.13	8 14 24.7	1.0	1.9	0.4
20	1 24 14.90	0.16	0.13	8 14 49.2	1.1	1.9	0.4
21	1 24 18.83	0.17	0.13	8 15 14.8	1.1	1.9	0.4
22	1 24 22.94	0.18	0.13	8 15 41.5	1.1	1.9	0.4
23	1 24 27.24	0.18	0.13	8 16 9.3	1.2	1.9	0.4
24	1 24 31.72	0.19	0.13	8 16 38.1	1.2	1.9	0.4
25	1 24 36.39	0.20	0.13	8 17 8.1	1.3	1.9	0.4
26	1 24 41.24	0.21	0.13	8 17 39.1	1.3	1.9	0.4
27	1 24 46.26	0.21	0.13	8 18 11.2	1.4	1.9	0.4
28	1 24 51.47	0.22	0.13	8 18 41.3	1.4	1.9	0.4
29	1 24 56.85	0.23	0.12	8 19 18.5	1.4	1.8	0.4
30	1 25 2.41	0.24	0.12	8 19 53.6	1.5	1.8	0.4
31	1 25 8.15	0.24	0.12	8 20 29.8	1.5	1.8	0.4
32	1 25 14.06	+ 0.25	0.12	N. 8 21 7.0	+ 1.6	1.8	0.4

## FEBRUARY, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
	<i>h m s</i>	<i>° ' "</i>		<i>h m</i>	<i>° ' "</i>	<i>° ' "</i>	
1	1 25 12.90	N. 8 20 59.7	1.3054021	4 39.1	25 29 0.8	S. 0 34 26.9	1.2987301
2	1 25 18.97	8 21 37.8	*3057492	4 35.3	25 29 40.1	0 34 26.5	*2987276
3	1 25 25.21	8 22 16.9	*3060938	4 31.5	25 30 19.5	0 34 26.2	*2987251
4	1 25 31.62	8 22 57.0	*3064358	4 27.7	25 30 58.8	0 34 25.8	*2987226
5	1 25 38.20	8 23 38.1	*3067752	4 23.8	25 31 38.2	0 34 25.4	*2987200
6	1 25 44.95	8 24 20.2	*3071119	4 20.0	25 32 17.5	0 34 25.1	*2987175
7	1 25 51.87	8 25 3.2	*3074457	4 16.2	25 32 56.8	0 34 24.7	*2987150
8	1 25 58.95	8 25 47.2	*3077767	4 12.4	25 33 36.2	0 34 24.4	*2987125
9	1 26 6.20	8 26 32.1	*3081046	4 8.6	25 34 15.5	0 34 24.0	*2987100
10	1 26 13.61	8 27 18.0	*3084294	4 4.8	25 34 54.9	0 34 23.6	*2987075
11	1 26 21.18	8 28 4.8	*3087519	4 0.9	25 35 34.2	0 34 23.3	*2987049
12	1 26 28.91	8 28 52.4	*3090694	3 57.1	25 36 13.6	0 34 22.9	*2987024
13	1 26 36.80	8 29 41.0	*3093844	3 53.3	25 36 52.9	0 34 22.6	*2986999
14	1 26 44.84	8 30 30.4	*3096960	3 49.5	25 37 32.2	0 34 22.2	*2986974
15	1 26 53.03	8 31 20.7	*3100040	3 45.8	25 38 11.6	0 34 21.8	*2986949
16	1 27 1.37	8 32 11.8	*3103084	3 42.0	25 38 50.9	0 34 21.5	*2986924
17	1 27 9.86	8 33 3.8	*3106091	3 38.2	25 39 30.2	0 34 21.1	*2986899
18	1 27 18.49	8 33 56.6	*3109061	3 34.4	25 40 9.6	0 34 20.7	*2986874
19	1 27 27.27	8 34 50.2	*3111992	3 30.6	25 40 48.9	0 34 20.4	*2986849
20	1 27 36.18	8 35 44.6	*3114884	3 26.8	25 41 28.2	0 34 20.0	*2986824
21	1 27 45.24	8 36 39.8	*3117736	3 23.0	25 42 7.6	0 34 19.7	*2986799
22	1 27 54.43	8 37 35.8	*3120547	3 19.2	25 42 46.9	0 34 19.3	*2986774
23	1 28 3.76	8 38 32.5	*3123318	3 15.5	25 43 26.2	0 34 18.9	*2986749
24	1 28 13.22	8 39 30.0	*3126047	3 11.7	25 44 5.5	0 34 18.6	*2986724
25	1 28 22.81	8 40 28.2	*3128735	3 7.9	25 44 44.8	0 34 18.2	*2986699
26	1 28 32.52	8 41 27.1	*3131379	3 4.1	25 45 24.2	0 34 17.9	*2986674
27	1 28 42.36	8 42 26.6	*3133981	3 0.4	25 46 3.5	0 34 17.5	*2986649
28	1 28 52.33	8 43 26.9	*3136538	2 56.6	25 46 42.8	0 34 17.1	*2986624
29	1 29 2.42	N. 8 44 27.8	1.3139052	2 52.8	25 47 22.1	S. 0 34 16.8	1.2986599



## FEBRUARY, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<i>h m s</i>	<i>s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>	<i>"</i>
1 25 14 '06	+ 0 '25	0 '12	N. 8 21 7 '0	+ 1 '6	1 '8	0 '4
1 25 20 '14	0 '26	0 '12	8 21 45 '2	1 '6	1 '8	0 '4
1 25 26 '40	0 '26	0 '12	8 22 24 '4	1 '7	1 '8	0 '4
1 25 32 '83	0 '27	0 '12	8 23 4 '6	1 '7	1 '8	0 '4
1 25 39 '42	0 '28	0 '12	8 23 45 '7	1 '7	1 '8	0 '4
1 25 46 '19	0 '29	0 '12	8 24 27 '9	1 '8	1 '8	0 '4
1 25 53 '12	0 '29	0 '12	8 25 11 '0	1 '8	1 '8	0 '4
1 26 0 '21	0 '30	0 '12	8 25 55 '0	1 '9	1 '8	0 '4
1 26 7 '47	0 '31	0 '12	8 26 40 '0	1 '9	1 '8	0 '4
1 26 14 '89	0 '31	0 '12	8 27 25 '9	1 '9	1 '8	0 '4
1 26 22 '46	0 '32	0 '12	8 28 12 '7	2 '0	1 '8	0 '4
1 26 30 '20	0 '33	0 '12	8 29 0 '4	2 '0	1 '8	0 '4
1 26 38 '09	0 '33	0 '12	8 29 48 '9	2 '0	1 '8	0 '4
1 26 46 '13	0 '34	0 '12	8 30 38 '3	2 '1	1 '8	0 '4
1 26 54 '32	0 '34	0 '12	8 31 28 '6	2 '1	1 '8	0 '4
1 27 2 '67	0 '35	0 '12	8 32 19 '7	2 '1	1 '8	0 '4
1 27 11 '16	0 '36	0 '12	8 33 11 '7	2 '2	1 '8	0 '4
1 27 19 '79	0 '36	0 '12	8 34 4 '5	2 '2	1 '8	0 '4
1 27 28 '56	0 '37	0 '12	8 34 58 '1	2 '3	1 '8	0 '4
1 27 37 '48	0 '37	0 '12	8 35 52 '5	2 '3	1 '8	0 '4
1 27 46 '53	0 '38	0 '12	8 36 47 '7	2 '3	1 '8	0 '4
1 27 55 '71	0 '39	0 '12	8 37 43 '6	2 '3	1 '8	0 '4
1 28 5 '03	0 '39	0 '12	8 38 40 '3	2 '4	1 '8	0 '4
1 28 14 '48	0 '40	0 '12	8 39 37 '7	2 '4	1 '8	0 '4
1 28 24 '06	0 '40	0 '12	8 40 35 '8	2 '4	1 '8	0 '4
1 28 33 '77	0 '41	0 '12	8 41 34 '6	2 '5	1 '8	0 '4
1 28 43 '60	0 '41	0 '12	8 42 34 '2	2 '5	1 '8	0 '4
1 28 53 '56	0 '42	0 '12	8 43 34 '4	2 '5	1 '8	0 '4
1 29 3 '64	+ 0 '43	0 '12	8 44 33 '2	+ 2 '5	1 '8	0 '4

## MARCH, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 29 2'42	N. 8 44 27'8	1'3139052	2 52'8	25 47 22'1	S. 0 34 16'8	1'298
2	1 29 12'62	8 45 29'3	'3141520	2 49'1	25 48 1'4	0 34 16'4	'298
3	1 29 22'95	8 46 31'5	'3143944	2 45'3	25 48 40'7	0 34 16'0	'298
4	1 29 33'39	8 47 34'4	'3146322	2 41'6	25 49 20'0	0 34 15'7	'298
5	1 29 43'94	8 48 37'8	'3148653	2 37'8	25 49 59'4	0 34 15'3	'298
6	1 29 54'60	8 49 41'8	'3150937	2 34'1	25 50 38'7	0 34 14'9	'298
7	1 30 5'37	8 50 46'4	'3153174	2 30'3	25 51 18'0	0 34 14'6	'298
8	1 30 16'25	8 51 51'6	'3155362	2 26'6	25 51 57'3	0 34 14'2	'298
9	1 30 27'23	8 52 57'4	'3157502	2 22'8	25 52 36'6	0 34 13'9	'298
10	1 30 38'31	8 54 3'7	'3159593	2 19'1	25 53 15'9	0 34 13'5	'298
11	1 30 49'49	8 55 10'5	'3161634	2 15'3	25 53 55'2	0 34 13'1	'298
12	1 31 0'77	8 56 17'8	'3163625	2 11'6	25 54 34'6	0 34 12'8	'298
13	1 31 12'14	8 57 25'6	'3165565	2 7'8	25 55 13'9	0 34 12'4	'298
14	1 31 23'60	8 58 33'9	'3167454	2 4'1	25 55 53'2	0 34 12'0	'298
15	1 31 35'15	8 59 42'7	'3169291	2 0'3	25 56 32'5	0 34 11'7	'298
16	1 31 46'78	9 0 51'9	'3171077	1 56'6	25 57 11'8	0 34 11'3	'298
17	1 31 58'49	9 2 1'5	'3172810	1 52'9	25 57 51'1	0 34 10'9	'298
18	1 32 10'29	9 3 11'5	'3174490	1 49'1	25 58 30'4	0 34 10'6	'298
19	1 32 22'17	9 4 21'9	'3176118	1 45'4	25 59 9'7	0 34 10'2	'298
20	1 32 34'12	9 5 32'7	'3177692	1 41'7	25 59 49'1	0 34 9'9	'298
21	1 32 46'14	9 6 43'8	'3179213	1 37'9	26 0 28'4	0 34 9'5	'298
22	1 32 58'23	9 7 55'3	'3180681	1 34'2	26 1 7'7	0 34 9'1	'298
23	1 33 10'39	9 9 7'1	'3182094	1 30'5	26 1 47'0	0 34 8'8	'298
24	1 33 22'62	9 10 19'3	'3183453	1 26'7	26 2 26'3	0 34 8'4	'298
25	1 33 34'90	9 11 31'7	'3184758	1 23'0	26 3 5'6	0 34 8'0	'298
26	1 33 47'25	9 12 44'5	'3186009	1 19'3	26 3 44'9	0 34 7'7	'298
27	1 33 59'65	9 13 57'5	'3187205	1 15'6	26 4 24'3	0 34 7'3	'298
28	1 34 12'10	9 15 10'7	'3188346	1 11'8	26 5 3'6	0 34 7'0	'298
29	1 34 24'60	9 16 24'2	'3189432	1 8'1	26 5 42'9	0 34 6'6	'298
30	1 34 37'16	9 17 37'9	'3190463	1 4'4	26 6 22'2	0 34 6'2	'298
31	1 34 49'77	9 18 51'8	'3191439	1 0'7	26 7 1'6	0 34 5'9	'298
32	1 35 2'42	N. 9 20 5'9	1'3192359	0 56'9	26 7 40'9	S. 0 34 5'5	1'298



## MARCH, 1850.

At Transit over the Meridian of Greenwich.

Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	1 29 3'64	+ 0'42	0'12	N. 8 44 35'2	+ 2'5	1'8	0'4
2	1 29 13'83	0'43	0'12	8 45 36'6	2'6	1'8	0'4
3	1 29 24'14	0'43	0'12	8 46 38'7	2'6	1'8	0'4
4	1 29 34'56	0'44	0'12	8 47 41'4	2'6	1'8	0'4
5	1 29 45'10	0'44	0'12	8 48 44'7	2'7	1'8	0'4
6	1 29 55'75	0'45	0'12	8 49 48'7	2'7	1'8	0'4
7	1 30 6'50	0'45	0'12	8 50 53'2	2'7	1'8	0'4
8	1 30 17'36	0'45	0'12	8 51 58'3	2'7	1'8	0'4
9	1 30 28'33	0'46	0'12	8 53 3'9	2'7	1'8	0'4
10	1 30 39'39	0'46	0'12	8 54 10'1	2'8	1'8	0'4
11	1 30 50'55	0'47	0'12	8 55 16'8	2'8	1'8	0'4
12	1 31 1'81	0'47	0'12	8 56 24'0	2'8	1'8	0'4
13	1 31 13'15	0'47	0'12	8 57 31'7	2'8	1'8	0'4
14	1 31 24'59	0'48	0'12	8 58 39'8	2'8	1'8	0'4
15	1 31 36'11	0'48	0'12	8 59 48'4	2'9	1'8	0'4
16	1 31 47'72	0'49	0'12	9 0 57'5	2'9	1'8	0'4
17	1 31 59'41	0'49	0'12	9 2 6'9	2'9	1'8	0'4
18	1 32 11'19	0'49	0'12	9 3 16'8	2'9	1'8	0'4
19	1 32 23'04	0'50	0'12	9 4 27'1	2'9	1'8	0'4
20	1 32 34'96	0'50	0'12	9 5 37'7	3'0	1'8	0'4
21	1 32 46'96	0'50	0'12	9 6 48'7	3'0	1'8	0'4
22	1 32 59'03	0'50	0'12	9 7 59'0	3'0	1'8	0'4
23	1 33 11'16	0'51	0'12	9 9 9'0	3'0	1'8	0'4
24	1 33 23'36	0'51	0'12	9 10 18'0	3'0	1'8	0'4
25	1 33 35'61	0'51	0'12	9 11 27'0	3'0	1'8	0'4
26	1 33 47'93	0'51	0'12	9 12 36'0	3'0	1'8	0'4
27	1 34 0'30	0'52	0'12	9 13 45'0	3'0	1'8	0'4
28	1 34 12'72	0'52	0'12	9 14 54'0	3'1	1'8	0'4
29	1 34 25'20	0'52	0'12	9 16 3'0	3'1	1'8	0'4
30	1 34 37'72	0'52	0'12	9 17 12'0	3'1	1'8	0'4
31	1 34 50'30	0'53	0'12	9 18 21'0	3'1	1'8	0'4
32	1 35 2'92	+ 0'53	0'12	9 19 30'0	3'1	1'8	0'4

APRIL, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vel.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1	h m s 1 35 2'42	N. 9 20 5'9	1'3192359	0 56'9	26 7 40'9	S. 0 34 5'5	1'2981
2	1 35 15'11	9 21 20'2	'3193224	0 53'2	26 8 20'2	0 34 5'1	'298
3	1 35 27'84	9 22 34'6	'3194033	0 49'5	26 8 59'5	0 34 4'8	'298
4	1 35 40'61	9 23 49'2	'3194786	0 45'8	26 9 38'9	0 34 4'4	'298
5	1 35 53'42	9 25 3'9	'3195483	0 42'1	26 10 18'2	0 34 4'0	'298
6	1 36 6'26	9 26 18'7	'3196123	0 38'3	26 10 57'6	0 34 3'7	'298
7	1 36 19'13	9 27 33'7	'3196706	0 34'6	26 11 36'9	0 34 3'3	'298
8	1 36 32'02	9 28 48'7	'3197233	0 30'9	26 12 16'2	0 34 3'0	'298
9	1 36 44'94	9 30 3'8	'3197703	0 27'2	26 12 55'6	0 34 2'6	'298
10	1 36 57'88	9 31 19'0	'3198116	0 23'5	26 13 34'9	0 34 2'2	'298
11	1 37 10'84	9 32 34'2	'3198471	0 19'8	26 14 14'2	0 34 1'9	'298
12	1 37 23'81	9 33 49'4	'3198769	0 16'0	26 14 53'6	0 34 1'5	'298
13	1 37 36'80	9 35 4'7	'3199011	0 12'3	26 15 32'9	0 34 1'1	'298
14	1 37 49'80	9 36 19'9	'3199195	0 8'6	26 16 12'3	0 34 0'8	'298
15	1 38 2'81	9 37 35'1	'3199322	0 4'9	26 16 51'6	0 34 0'4	'298
16	1 38 15'82	9 38 50'3	'3199392	{ 0 23'1 23 57'4 }	26 17 31'0	0 34 0'1	'298
17	1 38 28'83	9 40 5'4	'3199404	23 53'7	26 18 10'3	0 33 59'7	'298
18	1 38 41'84	9 41 20'4	'3199360	23 50'0	26 18 49'7	0 33 59'3	'298
19	1 38 54'85	9 42 35'4	'3199259	23 46'3	26 19 29'0	0 33 59'0	'298
20	1 39 7'85	9 43 50'3	'3199102	23 42'6	26 20 8'4	0 33 58'6	'298
21	1 39 20'85	9 45 5'0	'3198888	23 38'9	26 20 47'7	0 33 58'2	'298
22	1 39 33'84	9 46 19'6	'3198618	23 35'2	26 21 27'1	0 33 57'9	'298
23	1 39 46'81	9 47 34'1	'3198291	23 31'4	26 22 6'4	0 33 57'5	'298
24	1 39 59'77	9 48 48'4	'3197909	23 27'7	26 22 45'8	0 33 57'1	'298
25	1 40 12'70	9 50 2'5	'3197471	23 24'0	26 23 25'1	0 33 56'8	'298
26	1 40 25'62	9 51 16'5	'3196977	23 20'3	26 24 4'5	0 33 56'4	'298
27	1 40 38'52	9 52 30'2	'3196427	23 16'6	26 24 43'9	0 33 56'0	'298
28	1 40 51'39	9 53 43'8	'3195822	23 12'8	26 25 23'3	0 33 55'7	'298
29	1 41 4'23	9 54 57'1	'3195162	23 9'1	26 26 2'6	0 33 55'3	'298
30	1 41 17'05	9 56 10'2	'3194447	23 5'4	26 26 42'0	0 33 54'9	'298
31	1 41 29'83	N. 9 57 23'0	1'3193677	23 1'7	26 27 21'4	S. 0 33 54'6	1'298



## APRIL, 1850.

At Transit over the Meridian of Greenwich.

Day of the Month.	Apparent Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1	1 35 2 '92	+ 0 '53	0 '12	N. 9 20 8 '8	+ 3 '1	1 '8	0 '4
2	1 35 15 '58	0 '53	0 '12	9 21 22 '9	3 '1	1 '8	0 '4
3	1 35 28 '28	0 '53	0 '12	9 22 37 '2	3 '1	1 '8	0 '4
4	1 35 41 '02	0 '53	0 '12	9 23 51 '6	3 '1	1 '8	0 '4
5	1 35 53 '79	0 '53	0 '12	9 25 6 '1	3 '1	1 '8	0 '4
6	1 36 6 '60	0 '53	0 '12	9 26 20 '7	3 '1	1 '8	0 '4
7	1 36 19 '44	0 '54	0 '12	9 27 35 '5	3 '1	1 '8	0 '4
8	1 36 32 '30	0 '54	0 '12	9 28 50 '3	3 '1	1 '8	0 '4
9	1 36 45 '18	0 '54	0 '12	9 30 5 '2	3 '1	1 '8	0 '4
10	1 36 58 '09	0 '54	0 '12	9 31 20 '2	3 '1	1 '8	0 '4
11	1 37 11 '02	0 '54	0 '12	9 32 35 '2	3 '1	1 '8	0 '4
12	1 37 23 '96	0 '54	0 '12	9 33 50 '3	3 '1	1 '8	0 '4
13	1 37 36 '91	0 '54	0 '12	9 35 5 '3	3 '1	1 '8	0 '4
14	1 37 49 '88	0 '54	0 '12	9 36 20 '4	3 '1	1 '8	0 '4
15	1 38 2 '85	0 '54	0 '12	9 37 35 '4	3 '1	1 '8	0 '4
16	<sup>{</sup> 1 38 15 '03 <sup>}</sup>	<sup>{</sup> 0 '54 <sup>}</sup>	<sup>{</sup> 0 '12 <sup>}</sup>	<sup>{</sup> 9 38 50 '4 <sup>}</sup>	<sup>{</sup> 3 '1 <sup>}</sup>	<sup>{</sup> 1 '8 <sup>}</sup>	<sup>{</sup> 0 '4 <sup>}</sup>
17	1 38 41 '79	0 '54	0 '12	9 41 20 '1	3 '1	1 '8	0 '4
18	1 38 54 '76	0 '54	0 '12	9 42 34 '9	3 '1	1 '8	0 '4
19	1 39 7 '73	0 '54	0 '12	9 43 49 '6	3 '1	1 '8	0 '4
20	1 39 20 '69	0 '54	0 '12	9 45 4 '1	3 '1	1 '8	0 '4
21	1 39 33 '64	0 '54	0 '12	9 46 18 '5	3 '1	1 '8	0 '4
22	1 39 46 '58	0 '54	0 '12	9 47 32 '8	3 '1	1 '8	0 '4
23	1 39 59 '51	0 '54	0 '12	9 48 46 '9	3 '1	1 '8	0 '4
24	1 40 12 '41	0 '54	0 '12	9 50 0 '9	3 '1	1 '8	0 '4
25	1 40 25 '30	0 '54	0 '12	9 51 14 '7	3 '1	1 '8	0 '4
26	1 40 38 '16	0 '54	0 '12	9 52 28 '0	3 '1	1 '8	0 '4
27	1 40 51 '00	0 '53	0 '12	9 53 41 '8	3 '1	1 '8	0 '4
28	1 41 3 '81	0 '53	0 '12	9 54 55 '6	3 '1	1 '8	0 '4
29	1 41 16 '59	0 '53	0 '12	9 56 9 '4	3 '1	1 '8	0 '4
30	1 41 29 '34	0 '53	0 '12	9 57 23 '2	3 '1	1 '8	0 '4
31	1 41 42 '06	+ 0 '53	0 '12	N. 9 58 37 '0	+ 3 '1	1 '8	0 '4

MAY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. of Rad. Vect.
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.
1	1 41 29.83	N. 9 57 23.0	1.3193677	23 1.7	26 27 21.4	S. 0 33 54.6	1.29850
2	1 41 42.58	9 58 35.6	*3192852	22 58.0	26 28 0.7	0 33 54.2	*29850
3	1 41 55.29	9 59 47.8	*3191973	22 54.2	26 28 40.1	0 33 53.8	*29849
4	1 42 7.96	10 0 59.8	*3191039	22 50.5	26 29 19.5	0 33 53.5	*29849
5	1 42 20.59	10 2 11.5	*3190051	22 46.8	26 29 58.9	0 33 53.1	*29849
6	1 42 33.17	10 3 22.8	*3189008	22 43.1	26 30 38.3	0 33 52.7	*29848
7	1 42 45.71	10 4 33.8	*3187910	22 39.4	26 31 17.7	0 33 52.4	*29848
8	1 42 58.20	10 5 44.5	*3186759	22 35.6	26 31 57.0	0 33 52.0	*29848
9	1 43 10.63	10 6 54.8	*3185553	22 31.9	26 32 36.4	0 33 51.6	*29848
10	1 43 23.01	10 8 4.8	*3184294	22 28.2	26 33 15.8	0 33 51.3	*29848
11	1 43 35.33	10 9 14.3	*3182982	22 24.4	26 33 55.2	0 33 50.9	*29848
12	1 43 47.59	10 10 23.5	*3181618	22 20.7	26 34 34.6	0 33 50.5	*29848
13	1 43 59.79	10 11 32.2	*3180201	22 17.0	26 35 14.0	0 33 50.2	*29848
14	1 44 11.92	10 12 40.5	*3178732	22 13.2	26 35 53.4	0 33 49.8	*29848
15	1 44 23.99	10 13 48.4	*3177212	22 9.5	26 36 32.8	0 33 49.4	*29848
16	1 44 35.98	10 14 55.8	*3175640	22 5.8	26 37 12.2	0 33 49.1	*29848
17	1 44 47.90	10 16 2.7	*3174017	22 2.0	26 37 51.6	0 33 48.7	*29848
18	1 44 59.74	10 17 9.1	*3172344	21 58.3	26 38 31.0	0 33 48.3	*29848
19	1 45 11.51	10 18 15.0	*3170620	21 54.6	26 39 10.4	0 33 48.0	*29848
20	1 45 23.20	10 19 20.4	*3168847	21 50.8	26 39 49.8	0 33 47.6	*29848
21	1 45 34.81	10 20 25.3	*3167025	21 47.1	26 40 29.2	0 33 47.2	*29848
22	1 45 46.33	10 21 29.7	*3165154	21 43.3	26 41 8.6	0 33 46.9	*29848
23	1 45 57.76	10 22 33.5	*3163235	21 39.6	26 41 48.0	0 33 46.5	*29848
24	1 46 9.11	10 23 36.8	*3161269	21 35.9	26 42 27.4	0 33 46.1	*29848
25	1 46 20.37	10 24 39.5	*3159255	21 32.1	26 43 6.8	0 33 45.8	*29848
26	1 46 31.53	10 25 41.6	*3157195	21 28.4	26 43 46.3	0 33 45.4	*29848
27	1 46 42.60	10 26 43.1	*3155088	21 24.6	26 44 25.7	0 33 45.0	*29848
28	1 46 53.57	10 27 44.1	*3152936	21 20.9	26 45 5.1	0 33 44.7	*29848
29	1 47 4.45	10 28 44.4	*3150738	21 17.1	26 45 44.5	0 33 44.3	*29848
30	1 47 15.22	10 29 44.1	*3148494	21 13.4	26 46 24.0	0 33 43.9	*29848
31	1 47 25.89	10 30 43.2	*3146206	21 9.6	26 47 3.4	0 33 43.6	*29848
32	1 47 36.45	N. 10 31 41.6	1.3143873	21 5.8	26 47 42.8	S. 0 33 43.2	1.29848



MAY, 1850.

At Transit over the Meridian of Greenwich.

Star No.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
06	+ 0.53	0.12	N. 9 58 32.6	+ 3.0	1.8	0.4
74	0.53	0.12	9 59 44.7	3.0	1.8	0.4
38	0.53	0.12	10 0 56.5	3.0	1.8	0.4
98	0.52	0.12	10 2 8.0	3.0	1.8	0.4
54	0.52	0.12	10 3 19.2	3.0	1.8	0.4
04	0.52	0.12	10 4 30.1	2.9	1.8	0.4
50	0.52	0.12	10 5 40.6	2.9	1.8	0.4
91	0.52	0.12	10 6 50.7	2.9	1.8	0.4
26	0.51	0.12	10 8 0.5	2.9	1.8	0.4
55	0.51	0.12	10 9 9.9	2.9	1.8	0.4
78	0.51	0.12	10 10 18.9	2.9	1.8	0.4
95	0.51	0.12	10 11 27.5	2.9	1.8	0.4
06	0.50	0.12	10 12 33.7	2.8	1.8	0.4
09	0.50	0.12	10 13 43.4	2.8	1.8	0.4
06	0.50	0.12	10 14 50.6	2.8	1.8	0.4
96	0.49	0.12	10 15 57.4	2.8	1.8	0.4
78	0.49	0.12	10 17 3.7	2.8	1.8	0.4
52	0.49	0.12	10 18 9.5	2.7	1.8	0.4
18	0.48	0.12	10 19 14.8	2.7	1.8	0.4
77	0.48	0.12	10 20 19.5	2.7	1.8	0.4
27	0.48	0.12	10 21 23.8	2.7	1.8	0.4
68	0.47	0.12	10 22 27.5	2.6	1.8	0.4
01	0.47	0.12	10 23 30.6	2.6	1.8	0.4
24	0.47	0.12	10 24 33.2	2.6	1.8	0.4
39	0.46	0.12	10 25 35.2	2.6	1.8	0.4
44	0.46	0.12	10 26 36.7	2.5	1.8	0.4
40	0.45	0.12	10 27 37.5	2.5	1.8	0.4
25	0.45	0.12	10 28 37.8	2.5	1.8	0.4
01	0.45	0.12	10 29 37.4	2.5	1.8	0.4
66	0.44	0.12	10 30 36.4	2.4	1.8	0.4
21	0.44	0.12	10 31 34.8	2.4	1.8	0.4
65	+ 0.43	0.12	N. 10 32 32.5	+ 2.4	1.8	0.4

JUNE, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.	
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.
	Noon.	Noon.	Noon.		Noon.	Noon.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>
1	1 47 36.45	N. 10 31 41.6	1.3143873	21 5.8	26 47 42.8	S. 0 33 43.2
2	1 47 46.91	10 32 39.4	1.3141496	21 2.1	26 48 22.2	0 33 42.8
3	1 47 57.26	10 33 36.5	1.3139075	20 58.3	26 49 1.7	0 33 42.5
4	1 48 7.49	10 34 33.0	1.3136612	20 54.6	26 49 41.1	0 33 42.1
5	1 48 17.61	10 35 28.8	1.3134107	20 50.8	26 50 20.5	0 33 41.7
6	1 48 27.62	10 36 23.8	1.3131559	20 47.0	26 51 0.0	0 33 41.4
7	1 48 37.50	10 37 18.2	1.3128971	20 43.2	26 51 39.4	0 33 41.0
8	1 48 47.27	10 38 11.8	1.3126342	20 39.5	26 52 18.8	0 33 40.6
9	1 48 56.91	10 39 4.7	1.3123673	20 35.7	26 52 58.3	0 33 40.3
10	1 49 6.43	10 39 56.9	1.3120964	20 31.9	26 53 37.7	0 33 39.9
11	1 49 15.82	10 40 48.3	1.3118216	20 28.1	26 54 17.1	0 33 39.5
12	1 49 25.08	10 41 39.0	1.3115430	20 24.4	26 54 56.6	0 33 39.2
13	1 49 34.21	10 42 28.9	1.3112606	20 20.6	26 55 36.0	0 33 38.8
14	1 49 43.20	10 43 18.0	1.3109746	20 16.8	26 56 15.5	0 33 38.4
15	1 49 52.06	10 44 6.3	1.3106849	20 13.0	26 56 54.9	0 33 38.1
16	1 50 0.78	10 44 53.8	1.3103916	20 9.2	26 57 34.3	0 33 37.7
17	1 50 9.36	10 45 40.5	1.3100950	20 5.4	26 58 13.8	0 33 37.3
18	1 50 17.80	10 46 26.3	1.3097950	20 1.6	26 58 53.2	0 33 37.0
19	1 50 26.10	10 47 11.3	1.3094917	19 57.8	26 59 32.7	0 33 36.6
20	1 50 34.25	10 47 55.5	1.3091851	19 54.0	27 0 12.1	0 33 36.2
21	1 50 42.26	10 48 38.9	1.3088754	19 50.2	27 0 51.6	0 33 35.9
22	1 50 50.12	10 49 21.4	1.3085626	19 46.4	27 1 31.0	0 33 35.5
23	1 50 57.83	10 50 3.1	1.3082468	19 42.6	27 2 10.4	0 33 35.1
24	1 51 5.40	10 50 43.9	1.3079280	19 38.8	27 2 49.9	0 33 34.8
25	1 51 12.81	10 51 23.8	1.3076063	19 35.0	27 3 29.3	0 33 34.4
26	1 51 20.07	10 52 2.8	1.3072819	19 31.2	27 4 8.8	0 33 34.0
27	1 51 27.17	10 52 41.0	1.3069547	19 27.4	27 4 48.2	0 33 33.7
28	1 51 34.12	10 53 18.3	1.3066248	19 23.6	27 5 27.7	0 33 33.3
29	1 51 40.91	10 53 54.7	1.3062923	19 19.8	27 6 7.1	0 33 32.9
30	1 51 47.55	10 54 30.2	1.3059573	19 15.9	27 6 46.5	0 33 32.5
31	1 51 54.02	N. 10 55 4.7	1.3056199	19 12.1	27 7 26.0	S. 0 33 32.2



## JUNE, 1850.

At Transit over the Meridian of Greenwich.

<i>t</i> <i>n.</i>	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination,	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
'65	+ 0 '43	0 '12	N.10 32 32 '5	+ 2 '4	1 '8	0 '4
'98	0 '43	0 '12	10 33 29 '5	2 '4	1 '8	0 '4
'21	0 '42	0 '12	10 34 25 '9	2 '3	1 '8	0 '4
'32	0 '42	0 '12	10 35 21 '6	2 '3	1 '8	0 '4
'31	0 '41	0 '12	10 36 16 '6	2 '3	1 '8	0 '4
'19	0 '41	0 '12	10 37 10 '9	2 '2	1 '8	0 '4
'94	0 '40	0 '12	10 38 4 '5	2 '2	1 '8	0 '4
'58	0 '40	0 '12	10 38 57 '4	2 '2	1 '8	0 '4
'09	0 '39	0 '12	10 39 49 '5	2 '2	1 '8	0 '4
'47	0 '39	0 '12	10 40 40 '9	2 '1	1 '8	0 '4
'72	0 '38	0 '12	10 41 31 '6	2 '1	1 '8	0 '4
'85	0 '38	0 '12	10 42 21 '5	2 '1	1 '8	0 '4
'84	0 '37	0 '12	10 43 10 '6	2 '0	1 '8	0 '4
'70	0 '37	0 '12	10 43 58 '9	2 '0	1 '8	0 '4
'42	0 '36	0 '12	10 44 46 '4	2 '0	1 '8	0 '4
'00	0 '35	0 '12	10 45 33 '0	1 '9	1 '8	0 '4
'44	0 '35	0 '12	10 46 18 '9	1 '9	1 '8	0 '4
'73	0 '34	0 '12	10 47 4 '0	1 '9	1 '8	0 '4
'89	0 '34	0 '12	10 47 48 '2	1 '8	1 '8	0 '4
'90	0 '33	0 '12	10 48 31 '6	1 '8	1 '8	0 '4
'77	0 '32	0 '12	10 49 14 '1	1 '8	1 '8	0 '4
'49	0 '32	0 '12	10 49 55 '8	1 '7	1 '8	0 '4
'06	0 '31	0 '12	10 50 36 '6	1 '7	1 '8	0 '4
'48	0 '31	0 '12	10 51 16 '6	1 '6	1 '8	0 '4
'74	0 '30	0 '12	10 51 55 '7	1 '6	1 '8	0 '4
'86	0 '29	0 '12	10 52 34 '0	1 '6	1 '8	0 '4
'82	0 '29	0 '12	10 53 11 '3	1 '5	1 '8	0 '4
'62	0 '28	0 '12	10 53 47 '8	1 '5	1 '8	0 '4
'27	0 '27	0 '12	10 54 23 '3	1 '5	1 '8	0
'75	0 '27	0 '12	10 54 58 '0	1 '4	1 '8	
'08	+ 0 '26	0 '12	N.10 55 31 '7	+ 1 '4	1 '8	

JULY, 1850.

MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 51 54.02	N.10 55 4.7	1.3056199	19 12.1	27 7 26.0	S. 0 33 32.2	1.2981
2	1 52 0.33	10 55 38.3	1.3052801	19 8.3	27 8 5.4	0 33 31.8	1.2981
3	1 52 6.47	10 56 11.0	1.3049380	19 4.4	27 8 44.9	0 33 31.4	1.2983
4	1 52 12.45	10 56 42.8	1.3045937	19 0.6	27 9 24.3	0 33 31.1	1.2983
5	1 52 18.26	10 57 13.6	1.3042472	18 56.7	27 10 3.7	0 33 30.7	1.2983
6	1 52 23.90	10 57 43.5	1.3038987	18 52.9	27 10 43.2	0 33 30.3	1.2983
7	1 52 29.37	10 58 12.4	1.3035482	18 49.1	27 11 22.6	0 33 30.0	1.2983
8	1 52 34.67	10 58 40.3	1.3031958	18 45.2	27 12 2.1	0 33 29.6	1.2983
9	1 52 39.80	10 59 7.3	1.3028416	18 41.4	27 12 41.5	0 33 29.2	1.2983
10	1 52 44.75	10 59 33.3	1.3024857	18 37.5	27 13 20.9	0 33 28.9	1.2983
11	1 52 49.52	10 59 58.3	1.3021284	18 33.7	27 14 0.4	0 33 28.5	1.2981
12	1 52 54.12	11 0 22.4	1.3017696	18 29.8	27 14 39.8	0 33 28.1	1.2981
13	1 52 58.54	11 0 45.4	1.3014094	18 26.0	27 15 19.3	0 33 27.7	1.2981
14	1 53 2.78	11 1 7.5	1.3010480	18 22.1	27 15 58.7	0 33 27.4	1.2981
15	1 53 6.85	11 1 28.5	1.3006855	18 18.2	27 16 38.1	0 33 27.0	1.2981
16	1 53 10.73	11 1 48.6	1.3003218	18 14.4	27 17 17.6	0 33 26.6	1.2981
17	1 53 14.43	11 2 7.7	1.2999572	18 10.5	27 17 57.0	0 33 26.3	1.2981
18	1 53 17.96	11 2 25.7	1.2995916	18 6.6	27 18 36.5	0 33 25.9	1.2981
19	1 53 21.30	11 2 42.7	1.2992253	18 2.7	27 19 15.9	0 33 25.5	1.2981
20	1 53 24.46	11 2 58.7	1.2988583	17 58.9	27 19 55.3	0 33 25.1	1.2981
21	1 53 27.44	11 3 13.7	1.2984906	17 55.0	27 20 34.8	0 33 24.8	1.2981
22	1 53 30.23	11 3 27.7	1.2981225	17 51.1	27 21 14.2	0 33 24.4	1.2981
23	1 53 32.84	11 3 40.6	1.2977539	17 47.2	27 21 53.6	0 33 24.0	1.2981
24	1 53 35.27	11 3 52.5	1.2973851	17 43.3	27 22 33.1	0 33 23.7	1.2981
25	1 53 37.51	11 4 3.4	1.2970160	17 39.4	27 23 12.5	0 33 23.3	1.2981
26	1 53 39.56	11 4 13.3	1.2966467	17 35.5	27 23 51.9	0 33 22.9	1.2981
27	1 53 41.43	11 4 22.2	1.2962775	17 31.6	27 24 31.4	0 33 22.5	1.2981
28	1 53 43.11	11 4 30.0	1.2959083	17 27.7	27 25 10.8	0 33 22.2	1.2981
29	1 53 44.60	11 4 36.8	1.2955393	17 23.8	27 25 50.2	0 33 21.8	1.2981
30	1 53 45.91	11 4 42.6	1.2951705	17 19.9	27 26 29.6	0 33 21.4	1.2981
31	1 53 47.03	11 4 47.4	1.2948022	17 15.9	27 27 9.1	0 33 21.0	1.2981
32	1 53 47.96	N.11 4 51.1	1.2944343	17 12.0	27 27 48.5	S. 0 33 20.7	1.2981



JULY, 1850.

At Transit over the Meridian of Greenwich.

ent it ion.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
9 <sup>h</sup> 08 <sup>m</sup>	+ 0 <sup>s</sup> 26	0 <sup>s</sup> 12	N. 10 55 31 <sup>s</sup> 7	+ 1 <sup>s</sup> 4	1 <sup>s</sup> 8	0 <sup>s</sup> 4
5 <sup>h</sup> 24 <sup>m</sup>	0 <sup>s</sup> 25	0 <sup>s</sup> 12	10 56 4 <sup>s</sup> 5	1 <sup>s</sup> 3	1 <sup>s</sup> 8	0 <sup>s</sup> 4
1 <sup>h</sup> 24 <sup>m</sup>	0 <sup>s</sup> 25	0 <sup>s</sup> 12	10 56 36 <sup>s</sup> 4	1 <sup>s</sup> 3	1 <sup>s</sup> 8	0 <sup>s</sup> 4
7 <sup>h</sup> 07 <sup>m</sup>	0 <sup>s</sup> 24	0 <sup>s</sup> 12	10 57 7 <sup>s</sup> 3	1 <sup>s</sup> 3	1 <sup>s</sup> 8	0 <sup>s</sup> 4
2 <sup>h</sup> 73 <sup>m</sup>	0 <sup>s</sup> 23	0 <sup>s</sup> 12	10 57 37 <sup>s</sup> 3	1 <sup>s</sup> 2	1 <sup>s</sup> 8	0 <sup>s</sup> 4
8 <sup>h</sup> 22 <sup>m</sup>	0 <sup>s</sup> 23	0 <sup>s</sup> 13	10 58 6 <sup>s</sup> 3	1 <sup>s</sup> 2	1 <sup>s</sup> 9	0 <sup>s</sup> 4
3 <sup>h</sup> 55 <sup>m</sup>	0 <sup>s</sup> 22	0 <sup>s</sup> 13	10 58 34 <sup>s</sup> 4	1 <sup>s</sup> 2	1 <sup>s</sup> 9	0 <sup>s</sup> 4
8 <sup>h</sup> 70 <sup>m</sup>	0 <sup>s</sup> 21	0 <sup>s</sup> 13	10 59 1 <sup>s</sup> 5	1 <sup>s</sup> 1	1 <sup>s</sup> 9	0 <sup>s</sup> 4
3 <sup>h</sup> 67 <sup>m</sup>	0 <sup>s</sup> 20	0 <sup>s</sup> 13	10 59 27 <sup>s</sup> 6	1 <sup>s</sup> 1	1 <sup>s</sup> 9	0 <sup>s</sup> 4
8 <sup>h</sup> 47 <sup>m</sup>	0 <sup>s</sup> 20	0 <sup>s</sup> 13	10 59 52 <sup>s</sup> 8	1 <sup>s</sup> 0	1 <sup>s</sup> 9	0 <sup>s</sup> 4
3 <sup>h</sup> 10 <sup>m</sup>	0 <sup>s</sup> 19	0 <sup>s</sup> 13	11 0 17 <sup>s</sup> 0	1 <sup>s</sup> 0	1 <sup>s</sup> 9	0 <sup>s</sup> 4
7 <sup>h</sup> 55 <sup>m</sup>	0 <sup>s</sup> 18	0 <sup>s</sup> 13	11 0 40 <sup>s</sup> 2	0 <sup>s</sup> 9	1 <sup>s</sup> 9	0 <sup>s</sup> 4
1 <sup>h</sup> 82 <sup>m</sup>	0 <sup>s</sup> 17	0 <sup>s</sup> 13	11 1 2 <sup>s</sup> 5	0 <sup>s</sup> 9	1 <sup>s</sup> 9	0 <sup>s</sup> 4
5 <sup>h</sup> 91 <sup>m</sup>	0 <sup>s</sup> 17	0 <sup>s</sup> 13	11 1 23 <sup>s</sup> 7	0 <sup>s</sup> 9	1 <sup>s</sup> 9	0 <sup>s</sup> 4
9 <sup>h</sup> 83 <sup>m</sup>	0 <sup>s</sup> 16	0 <sup>s</sup> 13	11 1 43 <sup>s</sup> 9	0 <sup>s</sup> 8	1 <sup>s</sup> 9	0 <sup>s</sup> 4
3 <sup>h</sup> 56 <sup>m</sup>	0 <sup>s</sup> 15	0 <sup>s</sup> 13	11 2 3 <sup>s</sup> 2	0 <sup>s</sup> 8	1 <sup>s</sup> 9	0 <sup>s</sup> 4
7 <sup>h</sup> 12 <sup>m</sup>	0 <sup>s</sup> 14	0 <sup>s</sup> 13	11 2 21 <sup>s</sup> 4	0 <sup>s</sup> 7	1 <sup>s</sup> 9	0 <sup>s</sup> 4
0 <sup>h</sup> 50 <sup>m</sup>	0 <sup>s</sup> 14	0 <sup>s</sup> 13	11 2 38 <sup>s</sup> 6	0 <sup>s</sup> 7	1 <sup>s</sup> 9	0 <sup>s</sup> 4
3 <sup>h</sup> 70 <sup>m</sup>	0 <sup>s</sup> 13	0 <sup>s</sup> 13	11 2 54 <sup>s</sup> 8	0 <sup>s</sup> 7	1 <sup>s</sup> 9	0 <sup>s</sup> 4
6 <sup>h</sup> 71 <sup>m</sup>	0 <sup>s</sup> 12	0 <sup>s</sup> 13	11 3 10 <sup>s</sup> 0	0 <sup>s</sup> 6	1 <sup>s</sup> 9	0 <sup>s</sup> 4
9 <sup>h</sup> 54 <sup>m</sup>	0 <sup>s</sup> 11	0 <sup>s</sup> 13	11 3 24 <sup>s</sup> 2	0 <sup>s</sup> 6	1 <sup>s</sup> 9	0 <sup>s</sup> 4
2 <sup>h</sup> 19 <sup>m</sup>	0 <sup>s</sup> 11	0 <sup>s</sup> 13	11 3 37 <sup>s</sup> 4	0 <sup>s</sup> 5	1 <sup>s</sup> 9	0 <sup>s</sup> 4
4 <sup>h</sup> 66 <sup>m</sup>	0 <sup>s</sup> 10	0 <sup>s</sup> 13	11 3 49 <sup>s</sup> 6	0 <sup>s</sup> 5	1 <sup>s</sup> 9	0 <sup>s</sup> 4
6 <sup>h</sup> 94 <sup>m</sup>	0 <sup>s</sup> 09	0 <sup>s</sup> 13	11 4 0 <sup>s</sup> 7	0 <sup>s</sup> 4	1 <sup>s</sup> 9	0 <sup>s</sup> 4
9 <sup>h</sup> 04 <sup>m</sup>	0 <sup>s</sup> 08	0 <sup>s</sup> 13	11 4 10 <sup>s</sup> 8	0 <sup>s</sup> 4	1 <sup>s</sup> 9	0 <sup>s</sup> 4
0 <sup>h</sup> 95 <sup>m</sup>	0 <sup>s</sup> 08	0 <sup>s</sup> 13	11 4 19 <sup>s</sup> 9	0 <sup>s</sup> 4	1 <sup>s</sup> 9	0 <sup>s</sup> 4
2 <sup>h</sup> 68 <sup>m</sup>	0 <sup>s</sup> 07	0 <sup>s</sup> 13	11 4 28 <sup>s</sup> 0	0 <sup>s</sup> 3	1 <sup>s</sup> 9	0 <sup>s</sup> 4
4 <sup>h</sup> 22 <sup>m</sup>	0 <sup>s</sup> 06	0 <sup>s</sup> 13	11 4 35 <sup>s</sup> 1	0 <sup>s</sup> 3	1 <sup>s</sup> 9	0 <sup>s</sup> 4
5 <sup>h</sup> 57 <sup>m</sup>	0 <sup>s</sup> 05	0 <sup>s</sup> 13	11 4 41 <sup>s</sup> 2	0 <sup>s</sup> 2	1 <sup>s</sup> 9	0 <sup>s</sup> 4
6 <sup>h</sup> 74 <sup>m</sup>	0 <sup>s</sup> 04	0 <sup>s</sup> 13	11 4 46 <sup>s</sup> 2	0 <sup>s</sup> 2	1 <sup>s</sup> 9	0 <sup>s</sup> 4
7 <sup>h</sup> 72 <sup>m</sup>	0 <sup>s</sup> 04	0 <sup>s</sup> 13	11 4 50 <sup>s</sup> 2	0 <sup>s</sup> 1	1 <sup>s</sup> 9	0 <sup>s</sup> 4
18 <sup>h</sup> 51 <sup>m</sup>	+ 0 <sup>s</sup> 03	0 <sup>s</sup> 13	N. 11 4 53 <sup>s</sup> 2	+ 0 <sup>s</sup> 1	1 <sup>s</sup> 9	0 <sup>s</sup> 4

## AUGUST, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.			
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.	
	Noon.	Noon.	Noon.		Noon.	Noon.	No	
	<i>h m s</i>	<i>° ′ ″</i>		<i>h m</i>	<i>° ′ ″</i>	<i>° ′ ″</i>		
1	1 53 47.96	N. 11 4 51.1	1.2944343	17 12.0	27 27 48.5	S. 0 33 20.7	1.298	
2	1 53 48.70	11 4 53.8	.2940670	17 8.1	27 28 27.9	0 33 20.3	.298	
3	1 53 49.25	11 4 55.5	.2937003	17 4.2	27 29 7.3	0 33 19.9	.298	
4	1 53 49.61	11 4 56.1	.2933344	17 0.3	27 29 46.8	0 33 19.6	.298	
5	1 53 49.79	11 4 55.7	.2929694	16 56.3	27 30 26.2	0 33 19.2	.298	
6	1 53 49.77	11 4 54.2	.2926054	16 52.4	27 31 5.6	0 33 18.8	.298	
7	1 53 49.57	11 4 51.7	.2922425	16 48.5	27 31 45.0	0 33 18.4	.298	
8	1 53 49.18	11 4 48.2	.2918809	16 44.5	27 32 24.5	0 33 18.1	.298	
9	1 53 48.60	11 4 43.6	.2915206	16 40.6	27 33 3.9	0 33 17.7	.298	
10	1 53 47.83	11 4 38.0	.2911619	16 36.6	27 33 43.3	0 33 17.3	.298	
11	1 53 46.87	11 4 31.5	.2908048	16 32.7	27 34 22.7	0 33 16.9	.298	
12	1 53 45.73	11 4 23.9	.2904494	16 28.7	27 35 2.2	0 33 16.6	.298	
13	1 53 44.40	11 4 15.3	.2900958	16 24.8	27 35 41.6	0 33 16.2	.298	
14	1 53 42.89	11 4 5.6	.2897442	16 20.8	27 36 21.0	0 33 15.8	.298	
15	1 53 41.19	11 3 55.0	.2893946	16 16.8	27 37 0.4	0 33 15.4	.298	
16	1 53 39.31	11 3 43.3	.2890471	16 12.9	27 37 39.8	0 33 15.1	.298	
17	1 53 37.25	11 3 30.7	.2887019	16 8.9	27 38 19.2	0 33 14.7	.298	
18	1 53 35.00	11 3 17.0	.2883591	16 4.9	27 38 58.7	0 33 14.3	.298	
19	1 53 32.58	11 3 2.3	.2880187	16 1.0	27 39 38.1	0 33 13.9	.298	
20	1 53 29.97	11 2 46.7	.2876809	15 57.0	27 40 17.5	0 33 13.6	.298	
21	1 53 27.19	11 2 30.1	.2873457	15 53.0	27 40 56.9	0 33 13.2	.298	
22	1 53 24.23	11 2 12.5	.2870133	15 49.0	27 41 36.3	0 33 12.8	.298	
23	1 53 21.09	11 1 54.0	.2866837	15 45.0	27 42 15.7	0 33 12.5	.298	
24	1 53 17.78	11 1 34.5	.2863572	15 41.1	27 42 55.1	0 33 12.1	.298	
25	1 53 14.29	11 1 14.1	.2860337	15 37.1	27 43 34.5	0 33 11.7	.298	
26	1 53 10.63	11 0 52.7	.2857133	15 33.1	27 44 13.9	0 33 11.3	.298	
27	1 53 6.80	11 0 30.4	.2853963	15 29.1	27 44 53.3	0 33 11.0	.298	
28	1 53 2.80	11 0 7.2	.2850826	15 25.1	27 45 32.7	0 33 10.6	.298	
29	1 52 58.63	10 59 43.1	.2847724	15 21.1	27 46 12.1	0 33 10.2	.298	
30	1 52 54.29	10 59 18.1	.2844657	15 17.1	27 46 51.5	0 33 9.8	.298	
31	1 52 49.78	10 58 52.1	.2841628	15 13.1	27 47 30.9	0 33 9.5	.298	
32	1 52 45.11	N. 10 58 25.3	1.2838636	15 9.0	27 48 10.3	S. 0 33 9.1	1.298	



## AUGUST, 1850.

At Transit over the Meridian of Greenwich.

Right Ascension.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi-diameter.	Hor. Par.
"	"	"	° ' "	"	"	"
3° 51'	+ 0° 03'	0° 13'	N. 11 4 53° 2'	+ 0° 1'	1° 9'	0° 4'
3° 11'	0° 02'	0° 13'	11 4 55° 1'	+ 0° 1'	1° 9'	0° 4'
3° 53'	0° 01'	0° 13'	11 4 56° 0'	0° 0'	1° 9'	0° 4'
9° 76'	+ 0° 01'	0° 13'	11 4 55° 9'	0° 0'	1° 9'	0° 4'
9° 80'	0° 00'	0° 13'	11 4 54° 7'	— 0° 1'	1° 9'	0° 4'
9° 65'	— 0° 01'	0° 13'	11 4 52° 5'	0° 1'	1° 9'	0° 4'
9° 32'	0° 02'	0° 13'	11 4 49° 3'	0° 2'	1° 9'	0° 4'
8° 80'	0° 03'	0° 13'	11 4 45° 1'	0° 2'	1° 9'	0° 4'
8° 09'	0° 03'	0° 13'	11 4 39° 9'	0° 2'	1° 9'	0° 4'
7° 19'	0° 04'	0° 13'	11 4 33° 6'	0° 3'	1° 9'	0° 4'
6° 11'	0° 05'	0° 13'	11 4 26° 4'	0° 3'	1° 9'	0° 4'
4° 84'	0° 06'	0° 13'	11 4 18° 1'	0° 4'	1° 9'	0° 4'
3° 39'	0° 06'	0° 13'	11 4 8° 8'	0° 4'	1° 9'	0° 4'
1° 75'	0° 07'	0° 13'	11 3 58° 5'	0° 5'	1° 9'	0° 4'
9° 94'	0° 08'	0° 13'	11 3 47° 2'	0° 5'	1° 9'	0° 4'
7° 94'	0° 09'	0° 13'	11 3 34° 9'	0° 5'	1° 9'	0° 4'
5° 76'	0° 09'	0° 13'	11 3 21° 6'	0° 6'	1° 9'	0° 4'
3° 40'	0° 10'	0° 13'	11 3 7° 3'	0° 6'	1° 9'	0° 4'
0° 86'	0° 11'	0° 13'	11 2 52° 0'	0° 7'	1° 9'	0° 4'
8° 14'	0° 12'	0° 13'	11 2 35° 8'	0° 7'	1° 9'	0° 4'
5° 25'	0° 12'	0° 13'	11 2 18° 6'	0° 7'	1° 9'	0° 4'
2° 18'	0° 13'	0° 13'	11 2 0° 4'	0° 8'	1° 9'	0° 4'
8° 94'	0° 14'	0° 13'	11 1 41° 3'	0° 8'	1° 9'	0° 4'
5° 52'	0° 15'	0° 13'	11 1 21° 3'	0° 9'	1° 9'	0° 4'
1° 93'	0° 15'	0° 13'	11 1 0° 3'	0° 9'	1° 9'	0° 4'
8° 17'	0° 16'	0° 13'	11 0 38° 3'	0° 9'	1° 9'	0° 4'
4° 24'	0° 17'	0° 13'	11 0 15° 5'	1° 0'	1° 9'	0° 4'
0° 14'	0° 17'	0° 13'	10 59 51° 8'	1° 0'	1° 9'	0° 4'
5° 87'	0° 18'	0° 13'	10 59 27° 2'	1° 0'	1° 9'	0° 4'
1° 44'	0° 19'	0° 13'	10 59 1° 6'	1° 1'	1° 9'	0° 4'
6° 84'	0° 20'	0° 13'	10 58 35° 2'	1° 1'	1° 9'	0° 4'
2° 08'	— 0° 20'	0° 13'	N. 10 58 7° 9'	— 1° 2'	1° 9'	0° 4'

## SEPTEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Lat. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	
	<i>h m s</i>	<i>o ' "</i>		<i>h m</i>	<i>o ' "</i>	<i>o ' "</i>	
1	1 52 45.11	N. 10 58 25.3	1.2838636	15 9.0	27 48 10.3	S. 0 33 9.1	1.29
2	1 52 40.28	10 57 57.6	.2835684	15 5.0	27 48 49.7	0 33 8.7	.29
3	1 52 35.29	10 57 29.0	.2832772	15 1.0	27 49 29.1	0 33 8.4	.29
4	1 52 30.13	10 56 59.5	.2829902	14 57.0	27 50 8.5	0 33 8.0	.29
5	1 52 24.82	10 56 29.2	.2827074	14 53.0	27 50 47.9	0 33 7.6	.29
6	1 52 19.35	10 55 58.0	.2824289	14 49.0	27 51 27.3	0 33 7.2	.29
7	1 52 13.73	10 55 26.0	.2821549	14 44.9	27 52 6.7	0 33 6.9	.29
8	1 52 7.96	10 54 53.2	.2818855	14 40.9	27 52 46.1	0 33 6.5	.29
9	1 52 2.04	10 54 19.6	.2816208	14 36.9	27 53 25.5	0 33 6.1	.29
10	1 51 55.98	10 53 45.2	.2813608	14 32.8	27 54 4.9	0 33 5.7	.29
11	1 51 49.77	10 53 10.0	.2811057	14 28.8	27 54 44.3	0 33 5.4	.29
12	1 51 43.42	10 52 34.0	.2808555	14 24.7	27 55 23.7	0 33 5.0	.29
13	1 51 36.93	10 51 57.3	.2806104	14 20.7	27 56 3.1	0 33 4.6	.29
14	1 51 30.31	10 51 19.9	.2803705	14 16.7	27 56 42.5	0 33 4.2	.29
15	1 51 23.56	10 50 41.7	.2801357	14 12.6	27 57 21.9	0 33 3.9	.29
16	1 51 16.68	10 50 2.9	.2799063	14 8.6	27 58 1.3	0 33 3.5	.29
17	1 51 9.67	10 49 23.3	.2796822	14 4.5	27 58 40.7	0 33 3.1	.29
18	1 51 2.54	10 48 43.0	.2794635	14 0.5	27 59 20.1	0 33 2.7	.29
19	1 50 55.29	10 48 2.1	.2792504	13 56.4	27 59 59.5	0 33 2.4	.29
20	1 50 47.92	10 47 20.6	.2790429	13 52.4	28 0 38.9	0 33 2.0	.29
21	1 50 40.44	10 46 38.5	.2788410	13 48.3	28 1 18.3	0 33 1.6	.29
22	1 50 32.84	10 45 55.7	.2786449	13 44.3	28 1 57.7	0 33 1.3	.29
23	1 50 25.13	10 45 12.3	.2784545	13 40.2	28 2 37.1	0 33 0.9	.29
24	1 50 17.32	10 44 28.4	.2782701	13 36.1	28 3 16.5	0 33 0.5	.29
25	1 50 9.40	10 43 43.9	.2780916	13 32.1	28 3 55.9	0 33 0.1	.29
26	1 50 1.38	10 42 58.9	.2779191	13 28.0	28 4 35.3	0 32 59.7	.29
27	1 49 53.26	10 42 13.3	.2777527	13 23.9	28 5 14.7	0 32 59.4	.29
28	1 49 45.05	10 41 27.3	.2775926	13 19.9	28 5 54.1	0 32 59.0	.29
29	1 49 36.75	10 40 40.7	.2774386	13 15.8	28 6 33.5	0 32 58.6	.29
30	1 49 28.36	10 39 53.6	.2772910	13 11.7	28 7 12.9	0 32 58.2	.29
31	1 49 19.89	N. 10 39 6.1	1.2771498	13 7.6	28 7 52.3	S. 0 32 57.9	1.29
32	1						



## SEPTEMBER, 1850.

At Transit over the Meridian of Greenwich.

ent t ion.	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	Apparent Declination.	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
2° 08'	— 0° 20'	0° 13'	N. 10 58 7.9	— 1° 2'	1° 9'	0° 4'
7° 16'	0° 21'	0° 13'	10 57 39.7	1° 2'	1° 9'	0° 4'
2° 08'	0° 22'	0° 13'	10 57 10.6	1° 2'	1° 9'	0° 4'
6° 84'	0° 22'	0° 13'	10 56 40.7	1° 3'	1° 9'	0° 4'
1° 45'	0° 23'	0° 13'	10 56 10.0	1° 3'	1° 9'	0° 4'
5° 90'	0° 23'	0° 13'	10 55 38.4	1° 3'	1° 9'	0° 4'
0° 20'	0° 24'	0° 13'	10 55 5.9	1° 4'	1° 9'	0° 4'
4° 35'	0° 25'	0° 13'	10 54 32.7	1° 4'	1° 9'	0° 4'
8° 36'	0° 25'	0° 13'	10 53 58.7	1° 4'	1° 9'	0° 4'
2° 23'	0° 26'	0° 13'	10 53 23.9	1° 5'	1° 9'	0° 4'
5° 95'	0° 26'	0° 13'	10 52 48.4	1° 5'	1° 9'	0° 4'
9° 54'	0° 27'	0° 14'	10 52 12.1	1° 5'	2° 0'	0° 4'
2° 99'	0° 28'	0° 14'	10 51 35.0	1° 6'	2° 0'	0° 4'
6° 31'	0° 28'	0° 14'	10 50 57.2	1° 6'	2° 0'	0° 4'
9° 50'	0° 29'	0° 14'	10 50 18.8	1° 6'	2° 0'	0° 5'
2° 56'	0° 29'	0° 14'	10 49 39.6	1° 6'	2° 0'	0° 5'
5° 50'	0° 30'	0° 14'	10 48 59.7	1° 7'	2° 0'	0° 5'
8° 32'	0° 30'	0° 14'	10 48 19.2	1° 7'	2° 0'	0° 5'
1° 02'	0° 31'	0° 14'	10 47 38.1	1° 7'	2° 0'	0° 5'
3° 61'	0° 31'	0° 14'	10 46 56.3	1° 8'	2° 0'	0° 5'
6° 08'	0° 32'	0° 14'	10 46 13.9	1° 8'	2° 0'	0° 5'
3° 44'	0° 32'	0° 14'	10 45 30.9	1° 8'	2° 0'	0° 5'
0° 69'	0° 33'	0° 14'	10 44 47.4	1° 8'	2° 0'	0° 5'
2° 84'	0° 33'	0° 14'	10 44 3.3	1° 9'	2° 0'	0° 5'
1° 89'	0° 33'	0° 14'	10 43 18.6	1° 9'	2° 0'	0° 5'
5° 84'	0° 34'	0° 14'	10 42 33.4	1° 9'	2° 0'	0° 5'
3° 69'	0° 34'	0° 14'	10 41 47.6	1° 9'	2° 0'	0° 5'
0° 45'	0° 35'	0° 14'	10 41 1.4	1° 9'	2° 0'	0° 5'
2° 12'	0° 35'	0° 14'	10 40 14.7	2° 0'	2° 0'	0° 5'
3° 71'	0° 35'	0° 14'	10 39 27.5	2° 0'	2° 0'	0° 5'
5° 22'	— 0° 36'	0° 14'	N. 10 38 39.9	— 2° 0'	2° 0'	0° 5'

## OCTOBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log. Rad.
	Noon.	Noon.	Noon.		Noon.	Noon.	No.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	
1	1 49 19.89	N. 10 39 6.1	1.2771498	13 7.6	28 7 52.3	S. 0 32 57.9	1.298
2	1 49 11.34	10 38 18.2	1.2770150	13 3.6	28 8 31.8	0 32 57.5	1.298
3	1 49 2.71	10 37 29.9	1.2768868	12 59.5	28 9 11.2	0 32 57.1	1.298
4	1 48 54.01	10 36 41.1	1.2767651	12 55.4	28 9 50.6	0 32 56.7	1.298
5	1 48 45.23	10 35 52.0	1.2766501	12 51.4	28 10 30.0	0 32 56.4	1.298
6	1 48 36.39	10 35 2.5	1.2765418	12 47.3	28 11 9.4	0 32 56.0	1.298
7	1 48 27.49	10 34 12.7	1.2764402	12 43.2	28 11 48.8	0 32 55.6	1.298
8	1 48 18.53	10 33 22.6	1.2763454	12 39.1	28 12 28.2	0 32 55.2	1.298
9	1 48 9.52	10 32 32.2	1.2762574	12 35.0	28 13 7.7	0 32 54.9	1.298
10	1 48 0.46	10 31 41.5	1.2761762	12 30.9	28 13 47.1	0 32 54.5	1.298
11	1 47 51.35	10 30 50.5	1.2761019	12 26.9	28 14 26.5	0 32 54.1	1.298
12	1 47 42.20	10 29 59.4	1.2760345	12 22.8	28 15 5.9	0 32 53.7	1.298
13	1 47 33.01	10 29 8.0	1.2759741	12 18.7	28 15 45.3	0 32 53.3	1.298
14	1 47 23.79	10 28 16.5	1.2759207	12 14.6	28 16 24.8	0 32 53.0	1.298
15	1 47 14.54	10 27 24.8	1.2758743	12 10.5	28 17 4.2	0 32 52.6	1.298
16	1 47 5.27	10 26 33.0	1.2758348	12 6.4	28 17 43.6	0 32 52.2	1.298
17	1 46 55.97	10 25 41.1	1.2758024	12 2.4	28 18 23.0	0 32 51.8	1.298
18	1 46 46.65	10 24 49.1	1.2757770	11 58.3	28 19 2.5	0 32 51.5	1.298
19	1 46 37.32	10 23 57.1	1.2757587	11 54.2	28 19 41.9	0 32 51.1	1.298
20	1 46 27.98	10 23 5.0	1.2757475	11 50.1	28 20 21.3	0 32 50.7	1.298
21	1 46 18.63	10 22 12.9	1.2757432	11 46.0	28 21 0.7	0 32 50.3	1.298
22	1 46 9.28	10 21 20.8	1.2757459	11 41.9	28 21 40.2	0 32 49.9	1.298
23	1 45 59.93	10 20 28.7	1.2757556	11 37.8	28 22 19.6	0 32 49.6	1.298
24	1 45 50.59	10 19 36.7	1.2757724	11 33.7	28 22 59.1	0 32 49.2	1.298
25	1 45 41.25	10 18 44.7	1.2757962	11 29.6	28 23 38.5	0 32 48.8	1.298
26	1 45 31.93	10 17 52.8	1.2758271	11 25.6	28 24 17.9	0 32 48.4	1.298
27	1 45 22.62	10 17 1.0	1.2758651	11 21.5	28 24 57.4	0 32 48.0	1.298
28	1 45 13.34	10 16 9.3	1.2759102	11 17.4	28 25 36.8	0 32 47.7	1.298
29	1 45 4.08	10 15 17.8	1.2759624	11 13.3	28 26 16.3	0 32 47.3	1.298
30	1 44 54.85	10 14 26.4	1.2760216	11 9.2	28 26 55.7	0 32 46.9	1.298
31	1 44 45.65	10 13 35.2	1.2760879	11 5.1	28 27 35.2	0 32 46.5	1.298
32	1 44 36.49	N. 10 12 44.3	1.2761613	11 1.0	28 28 14.6	S. 0 32 46.2	1.298



## OCTOBER, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
19 15 '22	— 0 '36	0 '14	N.10 38 39 '9	— 2 '0	2 '0	0 '5
19 6 '65	0 '36	0 '14	10 37 51 '9	2 '0	2 '0	0 '5
18 58 '01	0 '36	0 '14	10 37 3 '5	2 '0	2 '0	0 '5
18 49 '29	0 '36	0 '14	10 36 14 '7	2 '0	2 '0	0 '5
18 40 '50	0 '37	0 '14	10 35 25 '5	2 '1	2 '0	0 '5
18 31 '65	0 '37	0 '14	10 34 36 '0	2 '1	2 '0	0 '5
18 22 '75	0 '37	0 '14	10 33 46 '2	2 '1	2 '0	0 '5
18 13 '79	0 '37	0 '14	10 32 56 '0	2 '1	2 '0	0 '5
18 4 '77	0 '38	0 '14	10 32 5 '6	2 '1	2 '0	0 '5
17 55 '71	0 '38	0 '14	10 31 14 '9	2 '1	2 '0	0 '5
17 46 '61	0 '38	0 '14	10 30 24 '0	2 '1	2 '0	0 '5
17 37 '46	0 '38	0 '14	10 29 32 '9	2 '1	2 '0	0 '5
17 28 '28	0 '38	0 '14	10 28 41 '6	2 '1	2 '0	0 '5
17 19 '08	0 '38	0 '14	10 27 50 '2	2 '1	2 '0	0 '5
17 9 '84	0 '39	0 '14	10 26 58 '6	2 '2	2 '0	0 '5
17 0 '58	0 '39	0 '14	10 26 6 '9	2 '2	2 '0	0 '5
16 51 '30	0 '39	0 '14	10 25 15 '1	2 '2	2 '0	0 '5
16 42 '00	0 '39	0 '14	10 24 23 '2	2 '2	2 '0	0 '5
16 32 '69	0 '39	0 '14	10 23 31 '3	2 '2	2 '0	0 '5
16 23 '37	0 '39	0 '14	10 22 39 '3	2 '2	2 '0	0 '5
16 14 '05	0 '39	0 '14	10 21 47 '4	2 '2	2 '0	0 '5
16 4 '72	0 '39	0 '14	10 20 55 '4	2 '2	2 '0	0 '5
15 55 '40	0 '39	0 '14	10 20 3 '5	2 '2	2 '0	0 '5
15 46 '09	0 '39	0 '14	10 19 11 '6	2 '2	2 '0	0 '5
15 36 '79	0 '39	0 '14	10 18 19 '8	2 '2	2 '0	0 '5
15 27 '50	0 '39	0 '14	10 17 28 '1	2 '2	2 '0	0 '5
15 18 '23	0 '39	0 '14	10 16 36 '5	2 '1	2 '0	0 '5
15 8 '98	0 '38	0 '14	10 15 45 '0	2 '1	2 '0	0 '5
14 59 '76	0 '38	0 '14	10 14 53 '7	2 '1	2 '0	0 '5
14 50 '57	0 '38	0 '14	10 14 2 '6	2 '1	2 '0	0 '5
14 41 '41	0 '38	0 '14	10 13 11 '7	2 '1	2 '0	0 '5
14 32 '30	— 0 '38	0 '14	N.10 12 21 '0	— 2 '1	2 '0	0 '5

## NOVEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.		
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	L Rad
	Noon.	Noon.	Noon.		Noon.	Noon.	
	h m s	° ' "		h m	° ' "	° ' "	
1	1 44 36.49	N. 10 12 44.3	1.2761613	11 1.0	28 28 14.6	S. 0 32 46.2	1.29
2	1 44 27.37	10 11 53.6	.2762416	10 57.0	28 28 54.1	0 32 45.8	.29
3	1 44 18.30	10 11 3.3	.2763289	10 52.9	28 29 33.5	0 32 45.4	.29
4	1 44 9.28	10 10 13.2	.2764231	10 48.8	28 30 13.0	0 32 45.0	.29
5	1 44 0.31	10 9 23.4	.2765243	10 44.7	28 30 52.5	0 32 44.6	.29
6	1 43 51.40	10 8 34.0	.2766324	10 40.7	28 31 31.9	0 32 44.3	.29
7	1 43 42.55	10 7 44.9	.2767473	10 36.6	28 32 11.4	0 32 43.9	.29
8	1 43 33.77	10 6 56.2	.2768690	10 32.5	28 32 50.8	0 32 43.5	.29
9	1 43 25.06	10 6 7.9	.2769974	10 28.4	28 33 30.3	0 32 43.1	.29
10	1 43 16.42	10 5 20.0	.2771325	10 24.4	28 34 9.8	0 32 42.7	.29
11	1 43 7.86	10 4 32.6	.2772742	10 20.3	28 34 49.2	0 32 42.3	.29
12	1 42 59.38	10 3 45.7	.2774225	10 16.2	28 35 28.7	0 32 42.0	.29
13	1 42 50.99	10 2 59.3	.2775774	10 12.1	28 36 8.2	0 32 41.6	.29
14	1 42 42.69	10 2 13.4	.2777387	10 8.1	28 36 47.6	0 32 41.2	.29
15	1 42 34.48	10 1 28.1	.2779063	10 4.0	28 37 27.1	0 32 40.8	.29
16	1 42 26.36	10 0 43.3	.2780803	9 59.9	28 38 6.6	0 32 40.4	.29
17	1 42 18.34	9 59 59.1	.2782606	9 55.9	28 38 46.1	0 32 40.1	.29
18	1 42 10.42	9 59 15.5	.2784470	9 51.8	28 39 25.5	0 32 39.7	.29
19	1 42 2.61	9 58 32.5	.2786396	9 47.8	28 40 5.0	0 32 39.3	.29
20	1 41 54.91	9 57 50.1	.2788382	9 43.7	28 40 44.5	0 32 38.9	.29
21	1 41 47.32	9 57 8.4	.2790427	9 39.6	28 41 24.0	0 32 38.5	.29
22	1 41 39.85	9 56 27.4	.2792532	9 35.6	28 42 3.5	0 32 38.2	.29
23	1 41 32.49	9 55 47.1	.2794695	9 31.5	28 42 43.0	0 32 37.8	.29
24	1 41 25.26	9 55 7.4	.2796915	9 27.5	28 43 22.5	0 32 37.4	.29
25	1 41 18.15	9 54 28.5	.2799192	9 23.4	28 44 2.0	0 32 37.0	.29
26	1 41 11.17	9 53 50.3	.2801526	9 19.4	28 44 41.5	0 32 36.6	.29
27	1 41 4.32	9 53 12.9	.2803915	9 15.3	28 45 21.0	0 32 36.2	.29
28	1 40 57.60	9 52 36.3	.2806358	9 11.3	28 46 0.5	0 32 35.9	.29
29	1 40 51.02	9 52 0.4	.2808855	9 7.2	28 46 40.0	0 32 35.5	.29
30	1 40 44.58	9 51 25.4	.2811405	9 3.2	28 47 19.5	0 32 35.1	.29
31	1 40 38.29	N. 9 50 51.2	1.2814007	8 59.2	28 47 59.0	S. 0 32 34.7	1.29



## NOVEMBER, 1850.

At Transit over the Meridian of Greenwich.

<i>arent ght nsion.</i>	Variation of Right Asc. in 1 Hour of Long.	Sid. Time of Sem. pass. Mer.	<i>Apparent Declination.</i>	Variation of Declination in 1 Hour of Long.	Semi- diameter.	Hor. Par.
			<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
32°30'	— 0°38'	0°14'	N.10 12 21°0	— 2°1'	2°0'	0°5'
23°23'	0°38'	0°14'	10 11 30°6	2°1'	2°0'	0°5'
14°20'	0°38'	0°14'	10 10 40°5	2°1'	2°0'	0°5'
5°23'	0°37'	0°14'	10 9 50°7	2°1'	2°0'	0°5'
56°31'	0°37'	0°14'	10 9 1°2	2°1'	2°0'	0°5'
47°45'	0°37'	0°14'	10 8 12°1	2°0'	2°0'	0°5'
38°66'	0°37'	0°14'	10 7 23°3	2°0'	2°0'	0°5'
29°93'	0°36'	0°14'	10 6 34°9	2°0'	2°0'	0°5'
21°28'	0°36'	0°14'	10 5 47°0	2°0'	2°0'	0°5'
12°70'	0°36'	0°14'	10 4 59°5	2°0'	2°0'	0°5'
4°20'	0°35'	0°14'	10 4 12°4	2°0'	2°0'	0°5'
55°78'	0°35'	0°14'	10 3 25°8	1°9'	2°0'	0°5'
47°45'	0°35'	0°14'	10 2 39°7	1°9'	2°0'	0°5'
39°21'	0°34'	0°14'	10 1 54°2	1°9'	2°0'	0°5'
31°06'	0°34'	0°14'	10 1 9°2	1°9'	2°0'	0°5'
23°01'	0°33'	0°14'	10 0 24°8	1°8'	2°0'	0°5'
15°05'	0°33'	0°14'	9 59 40°9	1°8'	2°0'	0°5'
7°20'	0°33'	0°14'	9 58 57°7	1°8'	2°0'	0°5'
59°45'	0°32'	0°14'	9 58 15°1	1°8'	2°0'	0°5'
51°82'	0°32'	0°14'	9 57 33°1	1°7'	2°0'	0°5'
44°30'	0°31'	0°14'	9 56 51°8	1°7'	2°0'	0°5'
36°89'	0°31'	0°14'	9 56 11°2	1°7'	2°0'	0°5'
29°60'	0°30'	0°14'	9 55 31°2	1°7'	2°0'	0°5'
22°44'	0°30'	0°14'	9 54 52°0	1°6'	2°0'	0°5'
15°40'	0°29'	0°14'	9 54 13°5	1°6'	2°0'	0°5'
8°49'	0°29'	0°14'	9 53 35°7	1°6'	2°0'	0°5'
1°71'	0°28'	0°14'	9 52 58°7	1°5'	2°0'	0°4'
55°07'	0°27'	0°14'	9 52 22°4	1°5'	2°0'	0°4'
48°56'	0°27'	0°14'	9 51 47°0	1°5'	2°0'	0°4'
42°19'	0°26'	0°13'	9 51 12°4	1°4'	1°9'	0°4'
35°97'	— 0°26'	0°13'	N.9 50 38°6	— 1°4'	1°9'	0°4'

## DECEMBER, 1850.

## MEAN TIME.

Day of the Month.	Geocentric.				Heliocentric.			
	Apparent Right Ascension.	Apparent Declination.	Log. of True Dist. from the Earth.	Meridian Passage.	Longitude.	Latitude.	Log Rad.	
Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	No.		
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>			
1	1 40 38.29	N.9 50 51.2	1.2814007	8 59.2	28 47 59.0	S.0 32 34.7	1.297	
2	1 40 32.14	9 50 17.8	.2816660	8 55.1	28 48 38.5	0 32 34.3	.297	
3	1 40 26.14	9 49 45.4	.2819362	8 51.1	28 49 18.0	0 32 33.9	.297	
4	1 40 20.29	9 49 13.8	.2822114	8 47.1	28 49 57.5	0 32 33.6	.297	
5	1 40 14.60	9 48 43.1	.2824913	8 43.1	28 50 37.0	0 32 33.2	.297	
6	1 40 9.07	9 48 13.3	.2827759	8 39.0	28 51 16.6	0 32 32.8	.297	
7	1 40 3.69	9 47 44.4	.2830651	8 35.0	28 51 56.1	0 32 32.4	.297	
8	1 39 58.48	9 47 16.5	.2833587	8 31.0	28 52 35.6	0 32 32.0	.297	
9	1 39 53.43	9 46 49.5	.2836566	8 27.0	28 53 15.1	0 32 31.6	.297	
10	1 39 48.55	9 46 23.5	.2839587	8 23.0	28 53 54.6	0 32 31.3	.297	
11	1 39 43.83	9 45 58.5	.2842650	8 19.0	28 54 34.1	0 32 30.9	.297	
12	1 39 39.29	9 45 34.5	.2845753	8 15.0	28 55 13.7	0 32 30.5	.297	
13	1 39 34.92	9 45 11.5	.2848894	8 11.0	28 55 53.2	0 32 30.1	.297	
14	1 39 30.72	9 44 49.5	.2852073	8 7.0	28 56 32.7	0 32 29.7	.297	
15	1 39 26.70	9 44 28.5	.2855288	8 3.0	28 57 12.2	0 32 29.3	.297	
16	1 39 22.86	9 44 8.5	.2858538	7 59.0	28 57 51.7	0 32 29.0	.297	
17	1 39 19.19	9 43 49.6	.2861822	7 55.0	28 58 31.3	0 32 28.6	.297	
18	1 39 15.70	9 43 31.7	.2865140	7 51.0	28 59 10.8	0 32 28.2	.297	
19	1 39 12.40	9 43 14.9	.2868489	7 47.0	28 59 50.3	0 32 27.8	.297	
20	1 39 9.28	9 42 59.1	.2871870	7 43.0	29 0 29.8	0 32 27.4	.297	
21	1 39 6.34	9 42 44.4	.2875280	7 39.0	29 1 9.4	0 32 27.0	.297	
22	1 39 3.59	9 42 30.8	.2878719	7 35.0	29 1 48.9	0 32 26.7	.297	
23	1 39 1.02	9 42 18.2	.2882185	7 31.1	29 2 28.4	0 32 26.3	.297	
24	1 38 58.65	9 42 6.8	.2885678	7 27.1	29 3 7.9	0 32 25.9	.297	
25	1 38 56.46	9 41 56.4	.2889196	7 23.1	29 3 47.4	0 32 25.5	.297	
26	1 38 54.46	9 41 47.1	.2892738	7 19.2	29 4 27.0	0 32 25.1	.297	
27	1 38 52.66	9 41 39.0	.2896303	7 15.2	29 5 6.5	0 32 24.7	.297	
28	1 38 51.05	9 41 31.9	.2899889	7 11.3	29 5 46.0	0 32 24.4	.297	
29	1 38 49.63	9 41 26.0	.2903496	7 7.3	29 6 25.5	0 32 24.0	.297	
30	1 38 48.41	9 41 21.2	.2907123	7 3.4	29 7 5.1	0 32 23.6	.297	
31	1 38 47.39	9 41 17.5	.2910767	6 59.4	29 7 44.6	0 32 23.2	.297	
32	1 38 46.56	N.9 41 14.9	1.2914428	6 55.5	29 8 24.1	S.0 32 22.8	1.297	



## DECEMBER, 1850.

At Transit over the Meridian of Greenwich.

<i>Apparent Right Ascension.</i>	<i>Variation of Right Asc. in 1 Hour of Long.</i>	<i>Sid. Time of Sem. pass. Mer.</i>	<i>Apparent Declination.</i>	<i>Variation of Declination in 1 Hour of Long.</i>	<i>Semi- diameter.</i>	<i>Hor. Par.</i>
<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>"</sup>	<sup>"</sup>
1 40 35.97	— 0.26	0.13	N. 9 50 38.6	— 1.4	1.9	0.4
1 40 29.89	0.25	0.13	9 50 5.6	1.4	1.9	0.4
1 40 23.97	0.24	0.13	9 49 33.6	1.3	1.9	0.4
1 40 18.19	0.24	0.13	9 49 2.4	1.3	1.9	0.4
1 40 12.57	0.23	0.13	9 48 32.1	1.2	1.9	0.4
1 40 7.11	0.22	0.13	9 48 2.7	1.2	1.9	0.4
1 40 1.81	0.22	0.13	9 47 34.3	1.2	1.9	0.4
1 39 56.67	0.21	0.13	9 47 6.8	1.1	1.9	0.4
1 39 51.69	0.20	0.13	9 46 40.3	1.1	1.9	0.4
1 39 46.88	0.20	0.13	9 46 14.7	1.0	1.9	0.4
1 39 42.24	0.19	0.13	9 45 50.1	1.0	1.9	0.4
1 39 37.77	0.18	0.13	9 45 26.5	1.0	1.9	0.4
1 39 33.47	0.18	0.13	9 45 3.9	0.9	1.9	0.4
1 39 29.34	0.17	0.13	9 44 42.3	0.9	1.9	0.4
1 39 25.39	0.16	0.13	9 44 21.7	0.8	1.9	0.4
1 39 21.62	0.15	0.13	9 44 2.1	0.8	1.9	0.4
1 39 18.02	0.15	0.13	9 43 43.6	0.8	1.9	0.4
1 39 14.60	0.14	0.13	9 43 26.1	0.7	1.9	0.4
1 39 11.37	0.13	0.13	9 43 9.7	0.7	1.9	0.4
1 39 8.31	0.12	0.13	9 42 54.3	0.6	1.9	0.4
1 39 5.44	0.12	0.13	9 42 40.0	0.6	1.9	0.4
1 39 2.76	0.11	0.13	9 42 26.7	0.5	1.9	0.4
1 39 0.26	0.10	0.13	9 42 14.5	0.5	1.9	0.4
1 38 57.95	0.09	0.13	9 42 3.4	0.4	1.9	0.4
1 38 55.82	0.08	0.13	9 41 53.4	0.4	1	
1 38 53.89	0.08	0.13	9 41 44.5	0.3	1	
1 38 52.15	0.07	0.13	9 41 36.7	0.3		
1 38 50.60	0.06	0.13	9 41 30.0	0.3		
1 38 49.25	0.05	0.13	9 41 24.4	0.2		
1 38 48.09	0.04	0.13	9 41 20.0	0.2		
1 38 47.13	0.04	0.13	9 41 16.6	0.1		
1 38 46.36	— 0.03	0.13	N. 9 41 14.4	— 0.1		

MEAN PLACES OF 100 PRINCIPAL FIXED STARS,  
FOR JANUARY 1, 1850.

Star's Name.	Mag.	Right Ascension.	Annual Var.	Declination.	Annual V.
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
α ANDROMEDÆ - - -	2	0 0 38.534	+ 3.0834	N.28 15 44.11	+19.91
γ PEGASI ( <i>Algenib</i> )	3.2	0 5 30.952	3.0817	N.14 20 57.79	20.03
β Hydri - - - - -	3	0 17 47.137	3.2985	S.78 5 59.43	20.25
α CASSIOPEÆ - - -	var.	0 32 1.545	3.3505	N.55 42 50.35	19.82
β Ceti - - - - -	2	0 36 3.362	+ 3.0129	S.18 48 39.61	+19.83
α URS. MIN. ( <i>Polaris</i> )	2	1 5 0.817	17.5957	N.88 30 35.28	19.27
θ <sup>1</sup> Ceti - - - - -	3	1 16 31.555	2.9996	S. 8 57 32.06	18.74
α Eridani ( <i>Achernar</i> )	1	1 32 7.302	2.2374	S.58 0 0.17	18.44
α ARIETIS - - - - -	2	1 58 43.575	+ 3.3626	N.22 45 2.18	+17.28
γ Ceti - - - - -	3.4	2 35 31.908	3.1003	N. 2 36 2.08	15.44
α CETI - - - - -	2.3	2 54 26.580	3.1265	N. 3 29 52.60	14.41
α PERSEI - - - - -	2	3 13 38.282	4.2389	N.49 19 20.47	13.26
η Tauri - - - - -	3	3 38 34.550	+ 3.5520	N.23 38 13.47	+11.53
γ <sup>1</sup> Eridani - - - - -	3	3 51 1.897	2.7960	S.13 56 19.64	10.59
α TAURI ( <i>Aldebaran</i> )	1	4 27 19.075	3.4331	N.16 12 11.26	7.72
α AURIGÆ ( <i>Capella</i> )	1	5 5 36.915	4.4185	N.45 50 20.49	4.28
β ORIONIS ( <i>Rigel</i> ) -	1	5 7 19.809	+ 2.8801	S. 8 22 45.51	+ 4.55
β TAURI - - - - -	2	5 16 48.760	3.7885	N.28 28 30.56	3.53
δ ORIONIS - - - - -	2	5 24 20.729	3.0661	S. 0 24 53.10	3.06
α Leporis - - - - -	3	5 26 6.945	2.6476	S.17 56 0.86	2.96
ε ORIONIS - - - - -	2	5 28 36.183	+ 3.0435	S. 1 18 8.19	+ 2.72
α COLUMBÆ - - - - -	2	5 34 13.171	2.1772	S.34 9 24.53	2.25
α ORIONIS - - - - -	var.	5 47 3.107	3.2468	N. 7 22 26.87	+ 1.13
μ Geminorum - - -	3	6 13 53.097	3.6357	N.22 35 6.63	- 1.34
α Argus - ( <i>Canopus</i> )	1	6 20 37.480	+ 1.3300	S.52 36 55.63	- 1.80
β <sup>1</sup> (Hev.) Cephei - -	5	6 28 33.613	30.7147	N.87 15 20.69	2.59
α CANIS MAJ. ( <i>Sirius</i> )	1	6 38 32.336	2.6446	S.16 30 52.65	4.58
ε Canis Majoris - -	2.1	6 52 43.858	2.3599	S.28 46 16.07	4.56
δ Geminorum - - -	3.4	7 11 9.649	+ 3.5965	N.22 15 12.57	- 6.14
α <sup>2</sup> GEMINOR. ( <i>Castor</i> )	2.1	7 25 1.283	3.8415	N.32 12 42.80	7.34
α CAN. MIN. ( <i>Procyon</i> )	1	7 31 26.733	3.1461	N. 5 36 19.22	8.84
β GEMINOR. ( <i>Pollux</i> )	1.2	7 36 7.796	3.6829	N.28 23 1.08	8.22
15 Argus - - - - -	3	8 1 9.396	+ 2.5576	S.23 52 30.69	-10.03
ε Hydræ - - - - -	3.4	8 38 49.767	3.1893	N. 6 57 56.55	12.84
ι Ursæ Majoris - - -	3	8 48 54.663	4.1488	N.48 37 35.68	13.76
ι Argus - - - - -	2	9 13 4.511	1.6020	S.58 38 48.80	14.89
α HYDRÆ - - - - -	2	9 20 12.881	+ 2.9481	S. 8 0 39.98	-15.33
θ Ursæ Majoris - - -	3	9 22 47.603	4.0622	N.52 21 27.10	16.09
ε Leonis - - - - -	3	9 37 19.682	3.4252	N.24 27 43.92	16.33
α LEONIS ( <i>Regulus</i> )	1.2	10 0 22.706	+ 3.2030	N.12 41 53.32	-17.37



MEAN PLACES OF 100 PRINCIPAL FIXED STARS,  
FOR JANUARY 1, 1850.

Star's Name.	Mag.	Right Ascension.	Annual Var.	Declination.	Annual Var.
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
$\eta$ Argus - - - - -	2	10 39 15.219	+ 2.3050	S. 58 53 47.87	-18.733
$\alpha$ URSE MAJORIS - -	2	10 54 25.694	3.7798	N. 62 33 33.89	19.330
$\delta$ LEONIS - - - - -	2.3	11 6 7.426	3.2069	N. 21 20 40.85	19.641
$\delta$ Hydræ et Crateris -	3.4	11 11 50.603	2.9947	S. 13 58 3.37	19.412
$\beta$ LEONIS - - - - -	2	11 41 24.253	+ 3.0659	N. 15 24 37.29	-20.083
$\gamma$ URSE MAJORIS - -	2.3	11 45 55.008	3.1984	N. 54 31 43.27	20.024
$\beta$ Chamæleontis - -	5	12 9 39.514	3.3049	S. 78 28 45.09	20.047
$\alpha$ Crucis - - - - -	1	12 18 17.540	3.2517	S. 62 15 59.44	19.941
$\beta$ Corvi - - - - -	2.3	12 26 30.869	+ 3.1308	S. 22 34 0.34	-19.991
$\delta$ Canum Venaticorum	3	12 49 0.138	2.8200	N. 39 7 46.11	19.544
$\alpha$ VIRGINIS - ( <i>Spica</i> )	1	13 17 17.734	3.1490	S. 10 22 36.61	18.952
$\eta$ URSE MAJORIS - -	2	13 41 37.421	2.3765	N. 50 3 48.55	18.146
$\eta$ Bootis - - - - -	3	13 47 32.503	+ 2.8592	N. 19 9 5.88	-18.231
$\beta$ Centauri - - - - -	1	13 53 17.196	4.1451	S. 39 38 45.69	17.723
$\alpha$ BOOTIS ( <i>Arcturus</i> )	1	14 8 49.201	2.7331	N. 19 57 56.09	18.928
$\alpha$ Centauri - - - - -	1	14 29 27.775	4.0193	S. 60 12 37.85	15.103
$\epsilon$ BOOTIS - - - - -	2.3	14 38 26.119	+ 2.6219	N. 27 42 32.87	-15.450
$\alpha$ LIBRÆ - - - - -	2.3	14 42 35.265	+ 3.3063	S. 15 24 54.75	15.247
$\beta$ URSE MINORIS - -	2	14 51 12.063	- 0.2729	N. 74 46 6.22	14.759
$\beta$ Libræ - - - - -	2	15 8 56.391	+ 3.2198	S. 8 49 33.05	13.615
$\alpha$ CORONÆ BOREALIS -	2	15 28 20.209	+ 2.5381	N. 27 13 21.24	-12.380
$\alpha$ SERPENTIS - - - -	2.3	15 36 52.878	+ 2.9512	N. 6 54 3.74	11.657
$\zeta$ URSE MINORIS - -	4.5	15 49 31.777	- 2.3299	N. 78 15 12.20	10.806
$\beta$ Scorpii - - - - -	2	15 56 43.270	+ 3.4778	S. 19 23 25.57	10.293
$\delta$ OPHIUCHI - - - -	3	16 6 29.271	+ 3.1376	S. 3 18 14.82	- 9.639
$\alpha$ SCORPII ( <i>Antares</i> )	1.2	16 20 13.024	3.6652	S. 26 5 38.61	8.464
$\eta$ DRACONIS - - - -	3.2	16 21 58.417	0.8197	N. 61 51 16.65	8.239
$\alpha$ Trianguli Australis -	2	16 32 50.112	+ 2.2633	S. 68 44 35.28	7.521
$\epsilon$ URSE MINORIS - -	4.5	17 1 30.959	- 6.5207	N. 82 16 32.24	-
$\alpha$ HERCULIS - - - -	var.	17 7 48.489	+ 2.7321	N. 14 33 54.8	-
$\beta$ DRACONIS - - - -	3.2	17 27 2.676	1.3499	N. 52 24 51 "	-
$\alpha$ OPHIUCHI - - - -	2	17 27 58.303	+ 2.7794	N. 12 40 "	-
$\sigma$ Octantis - - - -	6	17 30 2.896	107.6497	S. 89 16	-
$\gamma$ DRACONIS - - - -	2.3	17 53 7.426	1.3928	N. 51 3	-
$\mu$ Sagittarii - - - -	4	18 4 47.522	+ 3.5872	S. 21	-
$\delta$ URSE MINORIS - -	4.5	18 20 43.650	-19.2958	N. 86	-
$\alpha$ LYRÆ - - ( <i>Vega</i> )	1	18 31 51.519	+ 2.0310	N. 38	-
$\beta$ LYRÆ - - - - -	var.	18 44 32.466	2.2127	N. 3	-
$\zeta$ AQUILÆ - - - - -	3	18 58 30.875	2.7546	N	-
$\delta$ AQUILÆ - - - - -	3.4	19 17 55.998	+ 3.0247	N	-

MEAN PLACES OF 100 PRINCIPAL FIXED STARS,  
FOR JANUARY 1, 1850.

Star's Name.	Mag.	Right Ascension.	Annual Var.	Declination.	Annual Var.
$\gamma$ AQUILÆ - - - - -	3	<sup>h</sup> 19 <sup>m</sup> 39 <sup>s</sup> 7.634	+ 2.8553	N. 10° 15' 5".19	+ 8.419
$\alpha$ AQUILÆ - ( <i>Altair</i> )	1.2	19 43 27.787	2.9287	N. 8 28 33.69	9.139
$\beta$ AQUILÆ - - - - -	4	19 47 56.618	2.9497	N. 6 2 9.05	8.636
$\alpha$ CAPRICORNI - - -	3.4	20 9 43.596	+ 3.3351	S. 13 0 21.15	10.768
$\lambda$ URSE MINORIS - - -	5	20 13 1.926	-53.3307	N. 88 51 38.15	+10.987
$\alpha$ PAVONIS - - - - -	2	20 13 45.155	+ 4.8072	S. 57 12 35.18	11.024
$\alpha$ CYGNI - - - - -	2.1	20 36 19.069	2.0420	N. 44 44 47.66	12.649
$\delta$ CYGNI - - - - -	5.6	21 0 10.465	2.6728	N. 38 0 51.79	17.422
$\zeta$ CYGNI - - - - -	3	21 6 33.196	+ 2.5498	N. 29 36 50.59	+14.522
$\alpha$ CEPHEI - - - - -	3.2	21 14 59.697	1.4383	N. 61 57 4.41	15.079
$\beta$ AQUARI - - - - -	3	21 23 39.489	3.1676	S. 6 13 41.78	15.598
$\beta$ CEPHEI - - - - -	3	21 26 42.286	0.8058	N. 69 54 10.09	15.683
$\epsilon$ PEGASI - - - - -	2.3	21 36 49.111	+ 2.9510	N. 9 11 22.84	+16.288
$\alpha$ AQUARI - - - - -	3	21 58 4.590	3.0828	S. 1 2 47.71	17.291
$\alpha$ GRUIS - - - - -	2	21 58 45.361	3.8236	S. 47 41 3.20	17.135
$\zeta$ PEGASI - - - - -	3.4	22 33 58.866	2.9897	N. 10 2 59.41	18.679
$\alpha$ PIS. AUS. ( <i>Fomalhaut</i> )	1.2	22 49 20.978	+ 3.3347	S. 30 24 56.08	+18.960
$\alpha$ PEGASI ( <i>Markab</i> )	2	22 57 17.469	2.9832	N. 14 23 57.39	19.303
$\epsilon$ PISCII - - - - -	4.5	23 32 14.160	3.0852	N. 4 48 49.24	19.467
$\gamma$ CEPHEI - - - - -	3.4	23 33 13.977	+ 2.3877	N. 76 47 43.38	+20.079



## FORMULÆ OF REDUCTION,

ACCORDING TO THE LATE PROFESSOR BESSEL.

1.—*Adopting the Notation and Coefficients employed by the late Mr. Baily, in his Introduction to the Catalogue of Stars of the British Association.*

$$A = -18''.7322 \cos \odot$$

$$B = -20''.4200 \sin \odot$$

$$C = t - 0.02492 \sin 2 \odot - 0.34344 \sin \Omega + 0.00413 \sin 2 \Omega - 0.004 \sin 2 \zeta$$

$$D = -0.54470 \cos 2 \odot - 9''.25000 \cos \Omega + 0''.09030 \cos 2 \Omega - 0''.090 \cos 2 \zeta$$

$$a = \cos \alpha \sec \delta$$

$$b = \sin \alpha \sec \delta$$

$$c = 46''.0591 + 20''.0547 \sin \alpha \tan \delta$$

$$d = \cos \alpha \tan \delta$$

$$a' = \tan \omega \cos \delta - \sin \alpha \sin \delta$$

$$b' = \cos \alpha \sin \delta$$

$$c' = 20''.0547 \cos \alpha$$

$$d' = -\sin \alpha$$

$\Delta c$  = the annual proper motion in Right Ascension, *in arc*.

$\Delta c'$  = the annual proper motion in Declination.

Where  $t$  denotes the time from the beginning of the year, expressed in fractional parts of a year,  $\odot$  the Sun's and  $\zeta$  the Moon's true longitude,  $\Omega$  the mean longitude of the Moon's node, and  $\omega$  the obliquity of the Ecliptic, each for the time  $t$ :  $\alpha$  the mean Right Ascension, *in arc*, and  $\delta$  the mean Declination for the beginning of the year. Then, for the time represented by  $t$ ,

$$\text{Apparent R.A., in arc,} = \alpha + Aa + Bb + Cc + Dd + t\Delta c.$$

$$\text{Apparent Dec.} \quad \quad \quad = \delta + Aa' + Bb' + Cc' + Dd' + t\Delta c'.$$

2.—*Using the same Notation and Coefficients, and assuming*

$$46''.0591 C = f$$

$$B = h \cos H$$

$$20''.0547 C = g \cos G$$

$$A = h \sin H$$

$$D = g \sin G$$

$$A \tan \omega = i$$

$$\text{Apparent R.A., in arc,} = \alpha + f + t\Delta c$$

$$+ g \sin (G + \alpha) \tan \delta + h \sin (H + \alpha) \sec \delta$$

$$\text{Apparent Dec.} \quad \quad \quad = \delta + i \cos \delta + t\Delta c'$$

$$+ g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta$$

## CONSTANTS FOR FACILITATING THE REDUCTION OF STARS.

Day of the Month.	At Greenwich Mean Midnight.					
	<i>f</i>	<i>g</i>	<i>G</i>	<i>h</i>	<i>H</i>	<i>i</i>
Jan. 1	— 8° 49'	+ 9° 01'	114 13	+ 20° 30'	349 36	— 1° 58'
6	7° 74'	8° 82'	112 28	20° 23'	344 53	2° 29'
11	7° 01'	8° 62'	110 44	20° 14'	340 8	2° 97'
16	6° 30'	8° 43'	109 0	20° 03'	335 20	3° 63'
21	— 5° 63'	+ 8° 23'	107 19	+ 19° 91'	330 29	— 4° 26'
26	4° 98'	8° 04'	105 39	19° 77'	325 35	4° 85'
31	4° 37'	7° 86'	104 1	19° 63'	320 36	5° 41'
Feb. 5	3° 80'	7° 68'	102 25	19° 48'	315 34	5° 92'
10	— 3° 26'	+ 7° 52'	100 52	+ 19° 33'	310 27	— 6° 38'
15	2° 75'	7° 36'	99 22	19° 19'	305 17	6° 80'
20	2° 28'	7° 22'	97 53	19° 06'	300 3	7° 16'
25	1° 83'	7° 10'	96 28	18° 94'	294 45	7° 46'
Mar. 2	— 1° 41'	+ 6° 99'	95 3	+ 18° 84'	289 24	— 7° 71'
7	1° 01'	6° 91'	93 40	18° 76'	284 2	7° 90'
12	0° 63'	6° 84'	92 18	18° 71'	278 37	8° 03'
17	— 0° 25'	6° 79'	90 56	18° 68'	273 12	8° 10'
22	+ 0° 12'	+ 6° 76'	89 33	+ 18° 68'	267 48	— 8° 10'
27	0° 50'	6° 75'	88 10	18° 71'	262 25	8° 05'
April 1	0° 88'	6° 76'	86 44	18° 75'	257 4	7° 93'
6	1° 28'	6° 79'	85 17	18° 82'	251 46	7° 76'
11	+ 1° 70'	+ 6° 84'	83 46	+ 18° 92'	246 31	— 7° 53'
16	2° 15'	6° 90'	82 13	19° 03'	241 21	7° 25'
21	2° 62'	6° 98'	80 36	19° 15'	236 15	6° 91'
26	3° 12'	7° 08'	78 57	19° 28'	231 14	6° 53'
May 1	+ 3° 65'	+ 7° 18'	77 13	+ 19° 42'	226 20	— 6° 10'
6	4° 22'	7° 30'	75 27	19° 57'	221 30	5° 63'
11	4° 81'	7° 43'	73 37	19° 71'	216 44	5° 12'
16	5° 44'	7° 57'	71 45	19° 84'	212 2	4° 58'
21	+ 6° 10'	+ 7° 72'	69 51	+ 19° 95'	207 26	— 3° 99'
26	6° 79'	7° 87'	67 55	20° 06'	202 53	3° 39'
31	7° 50'	8° 02'	65 58	20° 17'	198 23	2° 76'
June 5	8° 24'	8° 17'	63 59	20° 25'	193 55	2° 12'
10	+ 8° 99'	+ 8° 33'	62 0	+ 20° 31'	189 30	— 1° 46'
15	9° 75'	8° 49'	60 0	20° 34'	185 6	0° 79'
20	10° 51'	8° 64'	58 1	20° 36'	180 44	— 0° 11'
25	11° 28'	8° 79'	56 3	20° 35'	176 21	+ 0° 56'
30	12° 04'	8° 94'	54 6	20° 32'	171 58	1° 23'
July 5	+ 12° 80'	+ 9° 09'	52 11	+ 20° 27'	167 35	+ 1° 89'



## CONSTANTS FOR FACILITATING THE REDUCTION OF STARS.

Day of the Month.		At Greenwich Mean Midnight.						
		<i>f</i>	<i>g</i>	<i>G</i>	<i>h</i>	<i>H</i>	<i>i</i>	
July	5	+12° 80	+ 9° 09	52 11	+20° 27	167 35	+ 1° 89	
	10	13° 54	9° 24	50 19	20° 20	163 9	2° 54	
	15	14° 26	9° 37	48 29	20° 11	158 41	3° 17	
	20	14° 96	9° 50	46 42	20° 01	154 10	3° 78	
	25	+15° 63	+ 9° 62	44 59	+19° 89	149 37	+ 4° 37	
	30	16° 28	9° 74	43 20	19° 76	144 59	4° 93	
	Aug.	4	16° 89	9° 86	41 46	19° 62	140 17	5° 44
		9	17° 47	9° 98	40 16	19° 48	135 31	5° 92
	14	+18° 02	+10° 08	38 51	+19° 33	130 41	+ 6° 37	
	19	18° 54	10° 18	37 32	19° 20	125 44	6° 76	
	24	19° 03	10° 29	36 19	19° 08	120 44	7° 11	
	29	19° 49	10° 39	35 12	18° 96	115 39	7° 42	
Sept.	3	+19° 93	+10° 49	34 11	+18° 86	110 30	+ 7° 67	
	8	20° 35	10° 59	33 15	18° 78	105 17	7° 86	
	13	20° 75	10° 71	32 26	18° 73	100 1	8° 00	
	18	21° 14	10° 82	31 43	18° 69	94 43	8° 08	
	23	+21° 53	+10° 94	31 4	+18° 68	89 23	+ 8° 11	
	28	21° 91	11° 08	30 31	18° 69	84 2	8° 07	
	Oct.	3	22° 30	11° 22	30 3	18° 73	78 41	7° 97
		8	22° 71	11° 38	29 38	18° 80	73 21	7° 82
	13	+23° 13	+11° 55	29 17	+18° 89	68 3	+ 7° 60	
	18	23° 57	11° 74	28 58	19° 00	62 47	7° 33	
	23	24° 04	11° 94	28 41	19° 12	57 34	7° 00	
	28	24° 54	12° 15	28 24	19° 25	52 24	6° 62	
Nov.	2	+25° 08	+12° 39	28 8	+19° 40	47 18	+ 6° 19	
	7	25° 64	12° 63	27 51	19° 55	42 16	5° 71	
	12	26° 25	12° 89	27 33	19° 69	37 18	5° 18	
	17	26° 89	13° 17	27 13	19° 83	32 23	4° 62	
	22	+27° 56	+13° 45	26 50	+19° 96	27 32	+ 4° 00	
	27	28° 26	13° 75	26 25	20° 07	22 44	3° 37	
	Dec.	2	28° 99	14° 04	25 58	20° 18	17 59	2° 70
		7	29° 75	14° 35	25 28	20° 26		2° 02
	12	+30° 52	+14° 65	24 55	+20° 32		+ 1° 32	
	17	31° 31	14° 96	24 19	20°		+ 0° 60	
	22	32° 10	15° 26	23 41			- 0° 19	
	27	32° 89	15° 56	23 1				
	32	+33° 67	+15° 85	22 20				

APPARENT PLACES OF  $\alpha$  AND  $\delta$  URSÆ MINORIS,  
FOR THE UPPER TRANSIT AT GREENWICH.

JANUARY.					FEBRUARY.				
Day of the Month.	$\alpha$ URSÆ MINOR. (Polaris)		$\delta$ URSÆ MINOR.		Day of the Month.	$\alpha$ URSÆ MINOR. (Polaris)		$\delta$ URSÆ MINOR.	
	R. A.	Dec. N.	R. A.	Dec. N.		R. A.	Dec. N.	R. A.	Dec. N.
	<sup>h</sup> 1 <sup>m</sup> 4	<sup>s</sup> 88 <sup>°</sup> 30'	<sup>h</sup> 18 <sup>m</sup> 20	<sup>s</sup> 86 <sup>°</sup> 35'		<sup>h</sup> 1 <sup>m</sup> 4	<sup>s</sup> 88 <sup>°</sup> 30'	<sup>h</sup> 18 <sup>m</sup> 20	<sup>s</sup> 86 <sup>°</sup> 35'
1	83° 39'	49° 5'	25° 31'	55° 7'	1	57° 60'	49° 2'	28° 30'	45° 7'
2	82° 56'	49° 6'	25° 29'	55° 4'	2	56° 82'	49° 0'	28° 51'	45° 4'
3	81° 73'	49° 7'	25° 29'	55° 0'	3	56° 04'	48° 9'	28° 72'	45° 1'
4	80° 90'	49° 8'	25° 30'	54° 7'	4	55° 27'	48° 8'	28° 94'	44° 8'
5	80° 06'	49° 9'	25° 31'	54° 4'	5	54° 51'	48° 6'	29° 16'	44° 6'
6	79° 22'	50° 0'	25° 33'	54° 0'	6	53° 75'	48° 5'	29° 39'	44° 3'
7	78° 37'	50° 0'	25° 36'	53° 7'	7	53° 00'	48° 4'	29° 62'	44° 0'
8	77° 52'	50° 0'	25° 40'	53° 3'	8	52° 26'	48° 2'	29° 85'	43° 7'
9	76° 67'	50° 0'	25° 45'	53° 0'	9	51° 52'	48° 1'	30° 09'	43° 5'
10	75° 82'	50° 1'	25° 50'	52° 7'	10	50° 79'	48° 0'	30° 33'	43° 3'
11	74° 97'	50° 1'	25° 55'	52° 4'	11	50° 08'	47° 8'	30° 58'	43° 0'
12	74° 12'	50° 1'	25° 60'	52° 1'	12	49° 37'	47° 6'	30° 84'	42° 8'
13	73° 28'	50° 1'	25° 66'	51° 7'	13	48° 67'	47° 4'	31° 10'	42° 5'
14	72° 44'	50° 1'	25° 74'	51° 4'	14	47° 97'	47° 2'	31° 37'	42° 3'
15	71° 60'	50° 1'	25° 83'	51° 1'	15	47° 27'	47° 0'	31° 65'	42° 1'
16	70° 76'	50° 1'	25° 92'	50° 7'	16	46° 59'	46° 8'	31° 93'	41° 8'
17	69° 92'	50° 1'	26° 02'	50° 4'	17	45° 93'	46° 6'	32° 21'	41° 6'
18	69° 08'	50° 1'	26° 12'	50° 1'	18	45° 28'	46° 4'	32° 50'	41° 4'
19	68° 24'	50° 1'	26° 23'	49° 7'	19	44° 64'	46° 2'	32° 79'	41° 2'
20	67° 40'	50° 0'	26° 35'	49° 4'	20	44° 02'	46° 0'	33° 09'	41° 0'
21	66° 56'	50° 0'	26° 48'	49° 0'	21	43° 40'	45° 8'	33° 39'	40° 8'
22	65° 72'	49° 9'	26° 62'	48° 7'	22	42° 79'	45° 6'	33° 69'	40° 6'
23	64° 89'	49° 9'	26° 76'	48° 4'	23	42° 20'	45° 4'	34° 00'	40° 4'
24	64° 06'	49° 8'	26° 90'	48° 1'	24	41° 62'	45° 1'	34° 31'	40° 2'
25	63° 24'	49° 8'	27° 05'	47° 8'	25	41° 05'	44° 9'	34° 62'	40° 0'
26	62° 42'	49° 7'	27° 21'	47° 5'	26	40° 49'	44° 7'	34° 94'	39° 8'
27	61° 60'	49° 6'	27° 38'	47° 2'	27	39° 95'	44° 4'	35° 26'	39° 7'
28	60° 79'	49° 5'	27° 55'	46° 8'	28	39° 42'	44° 2'	35° 58'	39° 5'
29	59° 99'	49° 4'	27° 73'	46° 5'	29	38° 90'	43° 9'	35° 91'	39° 4'
30	59° 19'	49° 3'	27° 91'	46° 2'					
31	58° 39'	49° 3'	28° 10'	46° 0'					
32	57° 60'	49° 2'	28° 30'	45° 7'					



APPARENT PLACES OF  $\alpha$  AND  $\delta$  URSÆ MINORIS,  
FOR THE UPPER TRANSIT AT GREENWICH.

MARCH.					APRIL.				
Day of the Month.	$\alpha$ URSÆ MINOR. (Polaris)		$\delta$ URSÆ MINOR.		Day of the Month.	$\alpha$ URSÆ MINOR. (Polaris)		$\delta$ URSÆ MINOR.	
	R. A.	Dec. N.	R. A.	Dec. N.		R. A.	Dec. N.	R. A.	Dec. N.
	<sup>h</sup> <sup>m</sup> 1 4	<sup>°</sup> <sup>'</sup> 88 30	<sup>h</sup> <sup>m</sup> 18 20	<sup>°</sup> <sup>'</sup> 86 35		<sup>h</sup> <sup>m</sup> 1 4	<sup>°</sup> <sup>'</sup> 88 30	<sup>h</sup> <sup>m</sup> 18 20	<sup>°</sup> <sup>'</sup> 86 35
1	38° 90'	43° 9'	35° 91'	39° 4'	1	29° 78'	34° 8'	46° 91'	37° 8'
2	38° 38'	43° 6'	36° 24'	39° 3'	2	29° 73'	34° 5'	47° 27'	37° 8'
3	37° 88'	43° 3'	36° 58'	39° 1'	3	29° 70'	34° 2'	47° 62'	37° 9'
4	37° 40'	43° 0'	36° 92'	39° 0'	4	29° 68'	33° 9'	47° 97'	37° 9'
5	36° 93'	42° 8'	37° 26'	38° 9'	5	29° 68'	33° 6'	48° 32'	37° 9'
6	36° 46'	42° 6'	37° 60'	38° 8'	6	29° 70'	33° 2'	48° 67'	38° 0'
7	36° 01'	42° 3'	37° 94'	38° 6'	7	{ <sup>29</sup> 78}	{ <sup>32</sup> 2}	49° 01'	38° 1'
8	35° 58'	42° 0'	38° 29'	38° 5'	8	29° 85'	32° 3'	49° 35'	38° 2'
9	35° 17'	41° 8'	38° 64'	38° 4'	9	29° 94'	32° 0'	49° 69'	38° 3'
10	34° 78'	41° 5'	38° 99'	38° 3'	10	30° 03'	31° 7'	50° 03'	38° 4'
11	34° 40'	41° 2'	39° 35'	38° 2'	11	30° 14'	31° 4'	50° 37'	38° 5'
12	34° 03'	40° 9'	39° 70'	38° 1'	12	30° 26'	31° 1'	50° 71'	38° 6'
13	33° 67'	40° 6'	40° 06'	38° 0'	13	30° 40'	30° 8'	51° 05'	38° 7'
14	33° 32'	40° 2'	40° 42'	38° 0'	14	30° 55'	30° 5'	51° 38'	38° 8'
15	32° 99'	39° 9'	40° 78'	37° 9'	15	30° 72'	30° 2'	51° 71'	38° 9'
16	32° 68'	39° 6'	41° 14'	37° 8'	16	30° 90'	29° 9'	52° 04'	39° 1'
17	32° 39'	39° 4'	41° 50'	37° 8'	17	31° 09'	29° 6'	52° 36'	39° 2'
18	32° 11'	39° 1'	41° 85'	37° 7'	18	31° 30'	29° 3'	52° 67'	39° 3'
19	31° 84'	38° 8'	42° 21'	37° 7'	19	31° 53'	29° 0'	52° 98'	39° 5'
20	31° 59'	38° 5'	42° 57'	37° 7'	20	31° 78'	28° 7'	53° 29'	39° 6'
21	31° 36'	38° 2'	42° 93'	37° 6'	21	32° 04'	28° 4'	53° 60'	39° 8'
22	31° 14'	37° 9'	43° 29'	37° 6'	22	32° 30'	28° 1'	53° 90'	40° 0'
23	30° 92'	37° 6'	43° 66'	37° 6'	23	32° 58'	27° 9'	54° 20'	40° 1'
24	30° 72'	37° 3'	44° 03'	37° 6'	24	32° 88'	27° 6'	54° 50'	40° 3'
25	30° 54'	37° 0'	44° 39'	37° 6'	25	33° 20'	27° 3'	54° 80'	40° 5'
26	30° 39'	36° 7'	44° 75'	37° 6'	26	33° 53'	27° 0'	55° 08'	40° 6'
27	30° 25'	36° 4'	45° 11'	37° 7'	27	33° 88'	26° 7'	55° 36'	40° 8'
28	30° 13'	36° 0'	45° 47'	37° 7'	28	34° 23'	26° 4'	55° 64'	41° 0'
29	30° 03'	35° 7'	45° 83'	37° 7'	29	34° 60'	26° 1'	55° 92'	41° 2'
30	29° 94'	35° 4'	46° 19'	37° 8'	30	34° 99'	25° 9'	56° 20'	41° 4'
31	29° 85'	35° 1'	46° 55'	37° 8'	31	35° 39'	25° 7'	56° 47'	41° 6'
32	29° 78'	34° 8'	46° 91'	37° 8'					

APPARENT PLACES OF  $\alpha$  AND  $\delta$  URSE MINORIS,  
FOR THE UPPER TRANSIT AT GREENWICH.

MAY.					JUNE.				
Day of the Month.	$\alpha$ URSE MINOR. (Polaris)		$\delta$ URSE MINOR.		Day of the Month.	$\alpha$ URSE MINOR. (Polaris)		$\delta$ URSE MINOR.	
	R. A.	Dec. N.	R. A.	Dec. N.		R. A.	Dec. N.	R. A.	Dec.
	<sup>h</sup> 1 <sup>m</sup> 4	<sup>°</sup> 88 <sup>'</sup> 30	<sup>h</sup> 18 <sup>m</sup> 20	<sup>°</sup> 86 <sup>'</sup> 35		<sup>h</sup> 1 <sup>m</sup> 4	<sup>°</sup> 88 <sup>'</sup> 30	<sup>h</sup> 18 <sup>m</sup> 21	<sup>°</sup> 86
1	35 <sup>s</sup> 39	25 <sup>s</sup> 7	56 <sup>s</sup> 47	41 <sup>s</sup> 6	1	53 <sup>s</sup> 24	19 <sup>s</sup> 5	2 <sup>s</sup> 14	49
2	35 <sup>s</sup> 79	25 <sup>s</sup> 4	56 <sup>s</sup> 73	41 <sup>s</sup> 8	2	53 <sup>s</sup> 96	19 <sup>s</sup> 4	2 <sup>s</sup> 23	50
3	36 <sup>s</sup> 21	25 <sup>s</sup> 1	56 <sup>s</sup> 99	42 <sup>s</sup> 0	3	54 <sup>s</sup> 69	19 <sup>s</sup> 3	2 <sup>s</sup> 31	50
4	36 <sup>s</sup> 64	24 <sup>s</sup> 9	57 <sup>s</sup> 24	42 <sup>s</sup> 3	4	55 <sup>s</sup> 42	19 <sup>s</sup> 2	2 <sup>s</sup> 39	50
5	37 <sup>s</sup> 09	24 <sup>s</sup> 6	57 <sup>s</sup> 48	42 <sup>s</sup> 5	5	56 <sup>s</sup> 15	19 <sup>s</sup> 1	2 <sup>s</sup> 46	50
6	37 <sup>s</sup> 56	24 <sup>s</sup> 4	57 <sup>s</sup> 72	42 <sup>s</sup> 7	6	56 <sup>s</sup> 89	19 <sup>s</sup> 0	2 <sup>s</sup> 52	50
7	38 <sup>s</sup> 03	24 <sup>s</sup> 2	57 <sup>s</sup> 96	42 <sup>s</sup> 9	7	57 <sup>s</sup> 64	18 <sup>s</sup> 9	2 <sup>s</sup> 57	50
8	38 <sup>s</sup> 52	24 <sup>s</sup> 0	58 <sup>s</sup> 20	43 <sup>s</sup> 1	8	58 <sup>s</sup> 41	18 <sup>s</sup> 8	2 <sup>s</sup> 62	50
9	39 <sup>s</sup> 02	23 <sup>s</sup> 7	58 <sup>s</sup> 43	43 <sup>s</sup> 4	9	59 <sup>s</sup> 18	18 <sup>s</sup> 7	2 <sup>s</sup> 67	50
10	39 <sup>s</sup> 53	23 <sup>s</sup> 4	58 <sup>s</sup> 66	43 <sup>s</sup> 7	10	59 <sup>s</sup> 94	18 <sup>s</sup> 6	2 <sup>s</sup> 71	50
11	40 <sup>s</sup> 04	23 <sup>s</sup> 2	58 <sup>s</sup> 87	43 <sup>s</sup> 9	11	60 <sup>s</sup> 70	18 <sup>s</sup> 5	2 <sup>s</sup> 74	50
12	40 <sup>s</sup> 57	23 <sup>s</sup> 0	59 <sup>s</sup> 08	44 <sup>s</sup> 2	12	61 <sup>s</sup> 47	18 <sup>s</sup> 5	2 <sup>s</sup> 77	50
13	41 <sup>s</sup> 10	22 <sup>s</sup> 8	59 <sup>s</sup> 29	44 <sup>s</sup> 4	13	62 <sup>s</sup> 25	18 <sup>s</sup> 4	2 <sup>s</sup> 79	53
14	41 <sup>s</sup> 65	22 <sup>s</sup> 6	59 <sup>s</sup> 49	44 <sup>s</sup> 6	14	63 <sup>s</sup> 04	18 <sup>s</sup> 3	2 <sup>s</sup> 80	53
15	42 <sup>s</sup> 21	22 <sup>s</sup> 4	59 <sup>s</sup> 69	44 <sup>s</sup> 9	15	63 <sup>s</sup> 84	18 <sup>s</sup> 3	2 <sup>s</sup> 80	54
16	42 <sup>s</sup> 79	22 <sup>s</sup> 2	59 <sup>s</sup> 88	45 <sup>s</sup> 2	16	64 <sup>s</sup> 63	18 <sup>s</sup> 2	2 <sup>s</sup> 80	54
17	43 <sup>s</sup> 38	22 <sup>s</sup> 0	60 <sup>s</sup> 06	45 <sup>s</sup> 5	17	65 <sup>s</sup> 42	18 <sup>s</sup> 2	2 <sup>s</sup> 79	54
18	43 <sup>s</sup> 98	21 <sup>s</sup> 8	60 <sup>s</sup> 24	45 <sup>s</sup> 8	18	66 <sup>s</sup> 21	18 <sup>s</sup> 2	2 <sup>s</sup> 78	55
19	44 <sup>s</sup> 58	21 <sup>s</sup> 6	60 <sup>s</sup> 42	46 <sup>s</sup> 0	19	67 <sup>s</sup> 01	18 <sup>s</sup> 2	2 <sup>s</sup> 77	55
20	45 <sup>s</sup> 19	21 <sup>s</sup> 4	60 <sup>s</sup> 59	46 <sup>s</sup> 3	20	67 <sup>s</sup> 82	18 <sup>s</sup> 1	2 <sup>s</sup> 75	55
21	45 <sup>s</sup> 82	21 <sup>s</sup> 2	60 <sup>s</sup> 75	46 <sup>s</sup> 5	21	68 <sup>s</sup> 63	18 <sup>s</sup> 1	2 <sup>s</sup> 72	56
22	46 <sup>s</sup> 46	21 <sup>s</sup> 0	60 <sup>s</sup> 90	46 <sup>s</sup> 8	22	69 <sup>s</sup> 44	18 <sup>s</sup> 1	2 <sup>s</sup> 68	56
23	47 <sup>s</sup> 10	20 <sup>s</sup> 8	61 <sup>s</sup> 05	47 <sup>s</sup> 1	23	70 <sup>s</sup> 26	18 <sup>s</sup> 1	2 <sup>s</sup> 63	56
24	47 <sup>s</sup> 74	20 <sup>s</sup> 7	61 <sup>s</sup> 20	47 <sup>s</sup> 4	24	71 <sup>s</sup> 08	18 <sup>s</sup> 1	2 <sup>s</sup> 58	56
25	48 <sup>s</sup> 39	20 <sup>s</sup> 6	61 <sup>s</sup> 34	47 <sup>s</sup> 7	25	71 <sup>s</sup> 89	18 <sup>s</sup> 1	2 <sup>s</sup> 52	57
26	49 <sup>s</sup> 05	20 <sup>s</sup> 4	61 <sup>s</sup> 47	47 <sup>s</sup> 9	26	72 <sup>s</sup> 71	18 <sup>s</sup> 1	2 <sup>s</sup> 46	57
27	49 <sup>s</sup> 73	20 <sup>s</sup> 2	61 <sup>s</sup> 59	48 <sup>s</sup> 2	27	73 <sup>s</sup> 53	18 <sup>s</sup> 1	2 <sup>s</sup> 39	57
28	50 <sup>s</sup> 42	20 <sup>s</sup> 1	61 <sup>s</sup> 71	48 <sup>s</sup> 5	28	74 <sup>s</sup> 35	18 <sup>s</sup> 1	2 <sup>s</sup> 31	58
29	51 <sup>s</sup> 11	19 <sup>s</sup> 9	61 <sup>s</sup> 82	48 <sup>s</sup> 8	29	75 <sup>s</sup> 17	18 <sup>s</sup> 2	2 <sup>s</sup> 23	58
30	51 <sup>s</sup> 81	19 <sup>s</sup> 8	61 <sup>s</sup> 93	49 <sup>s</sup> 1	30	75 <sup>s</sup> 99	18 <sup>s</sup> 2	2 <sup>s</sup> 14	58
31	52 <sup>s</sup> 52	19 <sup>s</sup> 7	62 <sup>s</sup> 04	49 <sup>s</sup> 4	31	76 <sup>s</sup> 81	18 <sup>s</sup> 2	2 <sup>s</sup> 04	59
32	53 <sup>s</sup> 24	19 <sup>s</sup> 5	62 <sup>s</sup> 14	49 <sup>s</sup> 7					



APPARENT PLACES OF  $\alpha$  AND  $\delta$  URSÆ MINORIS,  
FOR THE UPPER TRANSIT AT GREENWICH.

JULY.					AUGUST.				
Day of the Month.	$\alpha$ URSÆ MINOR. (Polaris)		$\delta$ URSÆ MINOR.		Day of the Month.	$\alpha$ URSÆ MINOR. (Polaris)		$\delta$ URSÆ MINOR.	
	R. A.	Dec. N.	R. A.	Dec. N.		R. A.	Dec. N.	R. A.	Dec. N.
	1 <sup>h</sup> 5 <sup>m</sup>	88° 30'	18 <sup>h</sup> 20 <sup>m</sup>	86° 35'		1 <sup>h</sup> 5 <sup>m</sup>	88° 30'	18 <sup>h</sup> 20 <sup>m</sup>	86° 36'
1	16° 81'	18° 2'	62° 04'	59° 1'	1	41° 42'	22° 1'	56° 24'	8° 0'
2	17° 64'	18° 3'	61° 94'	59° 4'	2	42° 16'	22° 3'	55° 97'	8° 2'
3	18° 47'	18° 4'	61° 84'	59° 7'	3	42° 89'	22° 5'	55° 69'	8° 4'
4	19° 29'	18° 4'	61° 73'	60° 0'	4	43° 62'	22° 7'	55° 41'	8° 6'
5	20° 11'	18° 5'	61° 61'	60° 4'	5	44° 34'	22° 9'	55° 13'	8° 9'
6	20° 92'	18° 5'	61° 49'	60° 7'	6	45° 04'	23° 1'	54° 84'	9° 1'
7	21° 74'	18° 6'	61° 36'	61° 0'	7	45° 73'	23° 3'	54° 55'	9° 3'
8	22° 56'	18° 7'	61° 22'	61° 3'	8	46° 42'	23° 6'	54° 25'	9° 5'
9	23° 38'	18° 8'	61° 08'	61° 5'	9	47° 11'	23° 8'	53° 94'	9° 7'
10	24° 20'	18° 9'	60° 93'	61° 8'	10	47° 80'	24° 0'	53° 63'	10° 0'
11	25° 02'	19° 0'	60° 77'	62° 1'	11	48° 48'	24° 3'	53° 32'	10° 2'
12	25° 84'	19° 1'	60° 61'	62° 4'	12	49° 15'	24° 5'	53° 00'	10° 4'
13	26° 65'	19° 2'	60° 43'	62° 7'	13	49° 81'	24° 7'	52° 68'	10° 6'
14	27° 46'	19° 3'	60° 25'	63° 0'	14	50° 46'	25° 0'	52° 36'	10° 8'
15	28° 27'	19° 4'	60° 07'	63° 3'	15	51° 11'	25° 2'	52° 03'	11° 0'
16	29° 07'	19° 5'	59° 89'	63° 6'	16	51° 76'	25° 5'	51° 69'	11° 2'
17	29° 87'	19° 6'	59° 70'	63° 9'	17	52° 39'	25° 8'	51° 35'	11° 4'
18	30° 66'	19° 7'	59° 51'	64° 2'	18	53° 02'	26° 1'	51° 01'	11° 6'
19	31° 45'	19° 8'	59° 32'	64° 5'	19	53° 64'	26° 4'	50° 67'	11° 8'
20	32° 24'	20° 0'	59° 12'	64° 8'	20	54° 26'	26° 7'	50° 32'	12° 0'
21	33° 02'	20° 2'	58° 91'	65° 0'	21	54° 86'	26° 9'	49° 97'	12° 2'
22	33° 81'	20° 3'	58° 69'	65° 3'	22	55° 44'	27° 2'	49° 62'	12° 4'
23	34° 59'	20° 5'	58° 47'	65° 6'	23	56° 02'	27° 5'	49° 26'	12° 5'
24	35° 37'	20° 6'	58° 24'	65° 8'	24	56° 59'	27° 8'	48° 90'	12° 7'
25	36° 14'	20° 7'	58° 01'	66° 0'	25	57° 14'	28° 1'	48° 53'	12° 8'
26	36° 91'	20° 9'	57° 78'	66° 3'	26	57° 68'	28° 4'	48° 17'	13° 0'
27	37° 67'	21° 1'	57° 54'	66° 6'	27	58° 23'	28° 7'	47° 80'	13° 2'
28	38° 43'	21° 3'	57° 29'	66° 8'	28	58° 78'	29° 0'	47° 43'	13° 3'
29	39° 19'	21° 5'	57° 03'	67° 1'	29	59° 32'	29° 3'	47° 05'	13° 4'
30	39° 94'	21° 7'	56° 77'	67° 4'	30	59° 84'	29° 6'	46° 67'	13° 6'
31	40° 68'	21° 9'	56° 51'	67° 7'	31	60° 34'	30° 0'	46° 29'	13° 7'
32	41° 42'	22° 1'	56° 24'	68° 0'	32	60° 84'	30° 3'	45° 91'	13° 8'

APPARENT PLACES OF  $\alpha$  AND  $\delta$  URSAE MINORIS,  
FOR THE UPPER TRANSIT AT GREENWICH.

SEPTEMBER.					OCTOBER.				
Day of the Month.	$\alpha$ URSAE MINOR. (Polaris)		$\delta$ URSAE MINOR.		Day of the Month.	$\alpha$ URSAE MINOR. (Polaris)		$\delta$ URSAE MINOR.	
	R. A.	Dec. N.	R. A.	Dec. N.		R. A.	Dec. N.	R. A.	Dec. N.
	<sup>h</sup> 1 <sup>m</sup> 6	<sup>s</sup> 88 <sup>o</sup> 30	<sup>h</sup> 18 <sup>m</sup> 20	<sup>s</sup> 86 <sup>o</sup> 36		<sup>h</sup> 1 <sup>m</sup> 6	<sup>s</sup> 88 <sup>o</sup> 30	<sup>h</sup> 18 <sup>m</sup> 20	<sup>s</sup> 86 <sup>o</sup> 36
1	0 <sup>s</sup> 84	30 <sup>s</sup> 3	45 <sup>s</sup> 91	13 <sup>s</sup> 8	1	10 <sup>s</sup> 90	40 <sup>s</sup> 9	33 <sup>s</sup> 56	15 <sup>s</sup> 1
2	1 <sup>s</sup> 33	30 <sup>s</sup> 6	45 <sup>s</sup> 52	13 <sup>s</sup> 9	2	11 <sup>s</sup> 06	41 <sup>s</sup> 2	33 <sup>s</sup> 14	15 <sup>s</sup> 1
3	1 <sup>s</sup> 81	30 <sup>s</sup> 9	45 <sup>s</sup> 13	14 <sup>s</sup> 1	3	11 <sup>s</sup> 21	41 <sup>s</sup> 6	32 <sup>s</sup> 72	15 <sup>s</sup> 1
4	2 <sup>s</sup> 29	31 <sup>s</sup> 2	44 <sup>s</sup> 74	14 <sup>s</sup> 2	4	11 <sup>s</sup> 34	42 <sup>s</sup> 0	32 <sup>s</sup> 29	15 <sup>s</sup> 1
5	2 <sup>s</sup> 76	31 <sup>s</sup> 5	44 <sup>s</sup> 35	14 <sup>s</sup> 3	5	11 <sup>s</sup> 46	42 <sup>s</sup> 3	31 <sup>s</sup> 86	15 <sup>s</sup> 1
6	3 <sup>s</sup> 20	31 <sup>s</sup> 9	43 <sup>s</sup> 96	14 <sup>s</sup> 4	6	11 <sup>s</sup> 56	42 <sup>s</sup> 7	31 <sup>s</sup> 44	15 <sup>s</sup> 1
7	3 <sup>s</sup> 63	32 <sup>s</sup> 2	43 <sup>s</sup> 56	14 <sup>s</sup> 5	7	11 <sup>s</sup> 65	43 <sup>s</sup> 1	31 <sup>s</sup> 02	15 <sup>s</sup> 1
8	4 <sup>s</sup> 06	32 <sup>s</sup> 5	43 <sup>s</sup> 16	14 <sup>s</sup> 6	8	11 <sup>s</sup> 73	43 <sup>s</sup> 5	30 <sup>s</sup> 60	15 <sup>s</sup> 1
9	4 <sup>s</sup> 49	32 <sup>s</sup> 9	42 <sup>s</sup> 75	14 <sup>s</sup> 7	9	11 <sup>s</sup> 79	43 <sup>s</sup> 9	30 <sup>s</sup> 18	15 <sup>s</sup> 1
10	4 <sup>s</sup> 92	33 <sup>s</sup> 2	42 <sup>s</sup> 34	14 <sup>s</sup> 8	10	11 <sup>s</sup> 84	44 <sup>s</sup> 3	29 <sup>s</sup> 76	15 <sup>s</sup> 1
11	5 <sup>s</sup> 32	33 <sup>s</sup> 5	41 <sup>s</sup> 93	14 <sup>s</sup> 9	11	11 <sup>s</sup> 88	44 <sup>s</sup> 6	29 <sup>s</sup> 34	15 <sup>s</sup> 1
12	5 <sup>s</sup> 71	33 <sup>s</sup> 9	41 <sup>s</sup> 52	15 <sup>s</sup> 0	12	11 <sup>s</sup> 92	45 <sup>s</sup> 0	28 <sup>s</sup> 92	15 <sup>s</sup> 1
13	6 <sup>s</sup> 08	34 <sup>s</sup> 3	41 <sup>s</sup> 11	15 <sup>s</sup> 0	13	11 <sup>s</sup> 94	45 <sup>s</sup> 4	28 <sup>s</sup> 51	15 <sup>s</sup> 1
14	6 <sup>s</sup> 44	34 <sup>s</sup> 6	40 <sup>s</sup> 70	15 <sup>s</sup> 1	14	11 <sup>s</sup> 94	45 <sup>s</sup> 8	28 <sup>s</sup> 10	15 <sup>s</sup> 0
15	6 <sup>s</sup> 79	35 <sup>s</sup> 0	40 <sup>s</sup> 29	15 <sup>s</sup> 2	15	11 <sup>s</sup> 93	46 <sup>s</sup> 2	27 <sup>s</sup> 68	14 <sup>s</sup> 9
16	7 <sup>s</sup> 13	35 <sup>s</sup> 3	39 <sup>s</sup> 88	15 <sup>s</sup> 2	16	11 <sup>s</sup> 90	46 <sup>s</sup> 6	27 <sup>s</sup> 26	14 <sup>s</sup> 8
17	7 <sup>s</sup> 46	35 <sup>s</sup> 6	39 <sup>s</sup> 47	15 <sup>s</sup> 3	17	11 <sup>s</sup> 86	46 <sup>s</sup> 9	26 <sup>s</sup> 85	14 <sup>s</sup> 7
18	7 <sup>s</sup> 78	36 <sup>s</sup> 0	39 <sup>s</sup> 05	15 <sup>s</sup> 4	18	11 <sup>s</sup> 81	47 <sup>s</sup> 3	26 <sup>s</sup> 44	14 <sup>s</sup> 6
19	8 <sup>s</sup> 09	36 <sup>s</sup> 4	38 <sup>s</sup> 63	15 <sup>s</sup> 4	19	11 <sup>s</sup> 75	47 <sup>s</sup> 7	26 <sup>s</sup> 04	14 <sup>s</sup> 5
20	8 <sup>s</sup> 39	36 <sup>s</sup> 7	38 <sup>s</sup> 21	15 <sup>s</sup> 5	20	11 <sup>s</sup> 67	48 <sup>s</sup> 0	25 <sup>s</sup> 63	14 <sup>s</sup> 4
21	8 <sup>s</sup> 68	37 <sup>s</sup> 1	37 <sup>s</sup> 79	15 <sup>s</sup> 5	21	11 <sup>s</sup> 58	48 <sup>s</sup> 4	25 <sup>s</sup> 23	14 <sup>s</sup> 3
22	8 <sup>s</sup> 95	37 <sup>s</sup> 5	37 <sup>s</sup> 37	15 <sup>s</sup> 5	22	11 <sup>s</sup> 48	48 <sup>s</sup> 8	24 <sup>s</sup> 83	14 <sup>s</sup> 2
23	9 <sup>s</sup> 22	37 <sup>s</sup> 8	36 <sup>s</sup> 95	15 <sup>s</sup> 6	23	11 <sup>s</sup> 36	49 <sup>s</sup> 1	24 <sup>s</sup> 43	14 <sup>s</sup> 1
24	9 <sup>s</sup> 47	38 <sup>s</sup> 2	36 <sup>s</sup> 53	15 <sup>s</sup> 6	24	11 <sup>s</sup> 23	49 <sup>s</sup> 5	24 <sup>s</sup> 03	14 <sup>s</sup> 0
25	9 <sup>s</sup> 71	38 <sup>s</sup> 6	36 <sup>s</sup> 10	15 <sup>s</sup> 6	25	11 <sup>s</sup> 09	49 <sup>s</sup> 9	23 <sup>s</sup> 64	13 <sup>s</sup> 8
26	9 <sup>s</sup> 94	39 <sup>s</sup> 0	35 <sup>s</sup> 68	15 <sup>s</sup> 6	26	10 <sup>s</sup> 94	50 <sup>s</sup> 3	23 <sup>s</sup> 25	13 <sup>s</sup> 7
27	10 <sup>s</sup> 15	39 <sup>s</sup> 3	35 <sup>s</sup> 26	15 <sup>s</sup> 6	27	10 <sup>s</sup> 78	50 <sup>s</sup> 7	22 <sup>s</sup> 86	13 <sup>s</sup> 5
28	10 <sup>s</sup> 35	39 <sup>s</sup> 7	34 <sup>s</sup> 84	15 <sup>s</sup> 6	28	10 <sup>s</sup> 61	51 <sup>s</sup> 1	22 <sup>s</sup> 47	13 <sup>s</sup> 4
29	10 <sup>s</sup> 54	40 <sup>s</sup> 1	34 <sup>s</sup> 41	15 <sup>s</sup> 6	29	10 <sup>s</sup> 43	51 <sup>s</sup> 4	22 <sup>s</sup> 08	13 <sup>s</sup> 3
30	10 <sup>s</sup> 72	40 <sup>s</sup> 5	33 <sup>s</sup> 98	15 <sup>s</sup> 6	30	10 <sup>s</sup> 23	51 <sup>s</sup> 8	21 <sup>s</sup> 70	13 <sup>s</sup> 1
31	10 <sup>s</sup> 90	40 <sup>s</sup> 9	33 <sup>s</sup> 56	15 <sup>s</sup> 6	31	10 <sup>s</sup> 01	52 <sup>s</sup> 2	21 <sup>s</sup> 32	12 <sup>s</sup> 9
					32	9 <sup>s</sup> 78	52 <sup>s</sup> 5	20 <sup>s</sup> 95	12 <sup>s</sup> 6



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ ANDROMEDÆ.		$\gamma$ PEGASI. (Algenib)		$\beta$ Hydri.	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. South.
	<sup>h</sup> 0	<sup>m</sup> 0	<sup>h</sup> 0	<sup>m</sup> 5	<sup>h</sup> 0	<sup>m</sup> 17
Jan. 1	37° 99'	48° 5'	30° 31'	57° 3'	43° 42'	83° 9'
11	37° 85'	47° 4'	30° 19'	56° 4'	42° 51'	82° 7'
21	37° 71'	46° 1'	30° 07'	55° 5'	41° 68'	81° 0'
31	37° 58'	44° 7'	29° 96'	54° 4'	40° 93'	78° 8'
Feb. 10	37° 47'	43° 1'	29° 87'	53° 3'	40° 29'	76° 2'
20	37° 40'	41° 4'	29° 81'	52° 2'	39° 79'	73° 1'
Mar. 2	37° 35'	39° 7'	29° 77'	51° 2'	39° 42'	69° 7'
12	37° 34'	38° 1'	29° 76'	50° 4'	39° 20'	66° 2'
22	37° 38'	36° 6'	29° 79'	49° 8'	39° 13'	62° 4'
Apr. 1	37° 46'	35° 4'	29° 87'	49° 4'	39° 25'	58° 3'
11	37° 59'	34° 6'	29° 98'	49° 3'	39° 52'	54° 5'
21	37° 76'	34° 1'	30° 14'	49° 6'	39° 95'	50° 9'
May 1	37° 97'	33° 9'	30° 34'	50° 1'	40° 53'	47° 4'
11	38° 23'	34° 2'	30° 57'	51° 0'	41° 25'	44° 2'
21	38° 52'	34° 8'	30° 83'	52° 1'	42° 10'	41° 4'
31	38° 83'	35° 9'	31° 12'	53° 6'	43° 05'	38° 9'
June 10	39° 15'	37° 2'	31° 42'	55° 2'	44° 08'	37° 0'
20	39° 49'	38° 9'	31° 74'	57° 1'	45° 18'	35° 5'
30	39° 82'	40° 9'	32° 05'	59° 1'	46° 32'	34° 5'
July 10	40° 14'	43° 0'	32° 36'	61° 2'	47° 46'	34° 1'
20	40° 45'	45° 4'	32° 64'	63° 3'	48° 57'	34° 3'
30	40° 72'	47° 8'	32° 91'	65° 4'	49° 62'	35° 1'
Aug. 9	40° 97'	50° 3'	33° 15'	67° 5'	50° 58'	36° 4'
19	41° 18'	52° 7'	33° 35'	69° 4'	51° 42'	38° 2'
29	41° 35'	55° 1'	33° 52'	71° 2'	52° 12'	40° 5'
Sept. 8	41° 47'	57° 4'	33° 65'	72° 8'	52° 65'	43° 1'
18	41° 56'	59° 6'	33° 74'	74° 2'	53° 00'	46° 0'
28	41° 61'	61° 5'	33° 79'	75° 4'	53° 16'	49° 0'
Oct. 8	41° 62'	63° 3'	33° 81'	76° 3'	53° 13'	52° 1'
18	41° 60'	64° 8'	33° 80'	77° 1'	52° 90'	55° 1'
28	41° 54'	66° 0'	33° 76'	77° 6'	52° 49'	57° 9'
Nov. 7	41° 46'	67° 0'	33° 70'	77° 8'	51° 93'	60° 4'
17	41° 36'	67° 6'	33° 61'	77° 9'	51° 23'	62° 6'
27	41° 24'	68° 0'	33° 51'	77° 8'	50° 42'	64° 2'
Dec. 7	41° 11'	68° 0'	33° 40'	77° 4'	49° 54'	65° 2'
17	40° 97'	67° 7'	33° 28'	76° 9'	48° 61'	65° 7'
27	40° 82'	67° 1'	33° 16'	76° 2'	47° 68'	65° 5'
37	40° 67'	66° 3'	33° 03'	75° 4'	46° 76'	64° 7'



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ CASSIOPEE.		$\beta$ Ceti.		$\delta^1$ Ceti.	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec. South.
	<sup>h</sup> 0 <sup>m</sup> 32	<sup>°</sup> 55 <sup>'</sup> 42	<sup>h</sup> 0 <sup>m</sup> 36	<sup>°</sup> 18 <sup>'</sup> 48	<sup>h</sup> 1 <sup>m</sup> 16	<sup>°</sup> 8 <sup>'</sup> 57
Jan. 1	1 <sup>s</sup> 63 <sup>s</sup>	61 <sup>"</sup> 4 <sup>"</sup>	2 <sup>s</sup> 59 <sup>s</sup>	52 <sup>"</sup> 6 <sup>"</sup>	31 <sup>s</sup> 13 <sup>s</sup>	42 <sup>"</sup> 9 <sup>"</sup>
11	1 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 30	60 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 6	2 <sup>s</sup> 46 <sup>s</sup> 0 <sup>"</sup> 13	53 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 5	31 <sup>s</sup> 00 <sup>s</sup> 0 <sup>"</sup> 13	43 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 7
21	1 <sup>s</sup> 04 <sup>s</sup> 0 <sup>"</sup> 29	59 <sup>"</sup> 8 <sup>"</sup> 1 <sup>"</sup> 0	2 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 13	53 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 2	30 <sup>s</sup> 87 <sup>s</sup> 0 <sup>"</sup> 13	44 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 6
31	0 <sup>s</sup> 76 <sup>s</sup> 0 <sup>"</sup> 28	58 <sup>"</sup> 3 <sup>"</sup> 1 <sup>"</sup> 5	2 <sup>s</sup> 21 <sup>s</sup> 0 <sup>"</sup> 12	53 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 0	30 <sup>s</sup> 74 <sup>s</sup> 0 <sup>"</sup> 13	44 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 4
	0 <sup>"</sup> 25	1 <sup>"</sup> 9	0 <sup>"</sup> 10	0 <sup>"</sup> 3	0 <sup>"</sup> 13	0 <sup>"</sup> 2
Feb. 10	0 <sup>s</sup> 51 <sup>s</sup> 0 <sup>"</sup> 21	56 <sup>"</sup> 4 <sup>"</sup> 2 <sup>"</sup> 3	2 <sup>s</sup> 11 <sup>s</sup> 0 <sup>"</sup> 09	53 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 6	30 <sup>s</sup> 61 <sup>s</sup> 0 <sup>"</sup> 11	44 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 1
20	0 <sup>s</sup> 30 <sup>s</sup> 0 <sup>"</sup> 16	54 <sup>"</sup> 1 <sup>"</sup> 2 <sup>"</sup> 4	2 <sup>s</sup> 02 <sup>s</sup> 0 <sup>"</sup> 07	52 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 9	30 <sup>s</sup> 50 <sup>s</sup> 0 <sup>"</sup> 10	44 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 3
Mar. 2	0 <sup>s</sup> 14 <sup>s</sup> 0 <sup>"</sup> 10	51 <sup>"</sup> 7 <sup>"</sup> 2 <sup>"</sup> 6	1 <sup>s</sup> 95 <sup>s</sup> 0 <sup>"</sup> 03	51 <sup>"</sup> 5 <sup>"</sup> 1 <sup>"</sup> 1	30 <sup>s</sup> 40 <sup>s</sup> 0 <sup>"</sup> 07	44 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 5
12	0 <sup>s</sup> 04 <sup>s</sup> 0 <sup>"</sup> 03	49 <sup>"</sup> 1 <sup>"</sup> 2 <sup>"</sup> 5	1 <sup>s</sup> 92 <sup>s</sup> 0 <sup>"</sup> 01	50 <sup>"</sup> 4 <sup>"</sup> 1 <sup>"</sup> 3	30 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 04	43 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 7
	0 <sup>"</sup> 01	46 <sup>"</sup> 6 <sup>"</sup> 2 <sup>"</sup> 7	1 <sup>s</sup> 91 <sup>s</sup> 0 <sup>"</sup> 05	49 <sup>"</sup> 1 <sup>"</sup> 1 <sup>"</sup> 8	30 <sup>s</sup> 29 <sup>s</sup> 0 <sup>"</sup> 00	43 <sup>"</sup> 2 <sup>"</sup> 1 <sup>"</sup> 0
Apr. 1	* 0 <sup>s</sup> 06 <sup>s</sup> 0 <sup>"</sup> 12	43 <sup>"</sup> 9 <sup>"</sup> 2 <sup>"</sup> 3	* 1 <sup>s</sup> 96 <sup>s</sup> 0 <sup>"</sup> 08	47 <sup>"</sup> 3 <sup>"</sup> 1 <sup>"</sup> 3	* 30 <sup>s</sup> 29 <sup>s</sup> 0 <sup>"</sup> 04	42 <sup>"</sup> 2 <sup>"</sup> 1 <sup>"</sup> 4
11	0 <sup>s</sup> 18 <sup>s</sup> 0 <sup>"</sup> 19	41 <sup>"</sup> 6 <sup>"</sup> 1 <sup>"</sup> 9	2 <sup>s</sup> 04 <sup>s</sup> 0 <sup>"</sup> 13	45 <sup>"</sup> 5 <sup>"</sup> 2 <sup>"</sup> 1	* 30 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 08	40 <sup>"</sup> 8 <sup>"</sup> 1 <sup>"</sup> 5
21	0 <sup>s</sup> 37 <sup>s</sup> 0 <sup>"</sup> 26	39 <sup>"</sup> 7 <sup>"</sup> 1 <sup>"</sup> 6	2 <sup>s</sup> 17 <sup>s</sup> 0 <sup>"</sup> 16	43 <sup>"</sup> 4 <sup>"</sup> 2 <sup>"</sup> 2	30 <sup>s</sup> 41 <sup>s</sup> 0 <sup>"</sup> 13	39 <sup>"</sup> 3 <sup>"</sup> 1 <sup>"</sup> 7
	0 <sup>"</sup> 33	38 <sup>"</sup> 1 <sup>"</sup> 1 <sup>"</sup> 2	2 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 21	41 <sup>"</sup> 2 <sup>"</sup> 2 <sup>"</sup> 2	30 <sup>s</sup> 54 <sup>s</sup> 0 <sup>"</sup> 17	37 <sup>"</sup> 6 <sup>"</sup> 1 <sup>"</sup> 9
May 1	0 <sup>s</sup> 63 <sup>s</sup> 0 <sup>"</sup> 38	36 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 7	2 <sup>s</sup> 54 <sup>s</sup> 0 <sup>"</sup> 24	39 <sup>"</sup> 0 <sup>"</sup> 2 <sup>"</sup> 4	30 <sup>s</sup> 71 <sup>s</sup> 0 <sup>"</sup> 20	35 <sup>"</sup> 7 <sup>"</sup> 2 <sup>"</sup> 0
11	0 <sup>s</sup> 96 <sup>s</sup> 0 <sup>"</sup> 41	36 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 1	2 <sup>s</sup> 78 <sup>s</sup> 0 <sup>"</sup> 27	36 <sup>"</sup> 6 <sup>"</sup> 2 <sup>"</sup> 3	30 <sup>s</sup> 91 <sup>s</sup> 0 <sup>"</sup> 24	33 <sup>"</sup> 7 <sup>"</sup> 2 <sup>"</sup> 1
21	1 <sup>s</sup> 34 <sup>s</sup> 0 <sup>"</sup> 45	36 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 3	3 <sup>s</sup> 05 <sup>s</sup> 0 <sup>"</sup> 29	34 <sup>"</sup> 3 <sup>"</sup> 2 <sup>"</sup> 3	31 <sup>s</sup> 15 <sup>s</sup> 0 <sup>"</sup> 27	31 <sup>"</sup> 6 <sup>"</sup> 2 <sup>"</sup> 1
31	1 <sup>s</sup> 75 <sup>s</sup> 0 <sup>"</sup> 47	36 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 8	3 <sup>s</sup> 34 <sup>s</sup> 0 <sup>"</sup> 31	32 <sup>"</sup> 0 <sup>"</sup> 2 <sup>"</sup> 2	31 <sup>s</sup> 42 <sup>s</sup> 0 <sup>"</sup> 29	29 <sup>"</sup> 5 <sup>"</sup> 2 <sup>"</sup> 2
June 10	2 <sup>s</sup> 20 <sup>s</sup> 0 <sup>"</sup> 47	37 <sup>"</sup> 2 <sup>"</sup> 1 <sup>"</sup> 2	3 <sup>s</sup> 65 <sup>s</sup> 0 <sup>"</sup> 32	29 <sup>"</sup> 8 <sup>"</sup> 2 <sup>"</sup> 0	31 <sup>s</sup> 71 <sup>s</sup> 0 <sup>"</sup> 30	27 <sup>"</sup> 3 <sup>"</sup> 2 <sup>"</sup> 1
20	2 <sup>s</sup> 67 <sup>s</sup> 0 <sup>"</sup> 46	38 <sup>"</sup> 4 <sup>"</sup> 1 <sup>"</sup> 8	3 <sup>s</sup> 97 <sup>s</sup> 0 <sup>"</sup> 32	27 <sup>"</sup> 8 <sup>"</sup> 1 <sup>"</sup> 8	32 <sup>s</sup> 01 <sup>s</sup> 0 <sup>"</sup> 31	25 <sup>"</sup> 2 <sup>"</sup> 2 <sup>"</sup> 0
30	3 <sup>s</sup> 14 <sup>s</sup> 0 <sup>"</sup> 44	40 <sup>"</sup> 2 <sup>"</sup> 2 <sup>"</sup> 0	4 <sup>s</sup> 29 <sup>s</sup> 0 <sup>"</sup> 31	26 <sup>"</sup> 0 <sup>"</sup> 1 <sup>"</sup> 5	32 <sup>s</sup> 32 <sup>s</sup> 0 <sup>"</sup> 31	23 <sup>"</sup> 2 <sup>"</sup> 1 <sup>"</sup> 3
July 10	4 <sup>s</sup> 04 <sup>s</sup> 0 <sup>"</sup> 41	42 <sup>"</sup> 2 <sup>"</sup> 2 <sup>"</sup> 4	4 <sup>s</sup> 60 <sup>s</sup> 0 <sup>"</sup> 30	24 <sup>"</sup> 5 <sup>"</sup> 1 <sup>"</sup> 2	32 <sup>s</sup> 63 <sup>s</sup> 0 <sup>"</sup> 29	21 <sup>"</sup> 4 <sup>"</sup> 1 <sup>"</sup> 6
20	4 <sup>s</sup> 45 <sup>s</sup> 0 <sup>"</sup> 37	44 <sup>"</sup> 6 <sup>"</sup> 2 <sup>"</sup> 8	4 <sup>s</sup> 90 <sup>s</sup> 0 <sup>"</sup> 26	23 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 9	32 <sup>s</sup> 92 <sup>s</sup> 0 <sup>"</sup> 28	19 <sup>"</sup> 8 <sup>"</sup> 1 <sup>"</sup> 3
30	4 <sup>s</sup> 82 <sup>s</sup> 0 <sup>"</sup> 32	47 <sup>"</sup> 4 <sup>"</sup> 2 <sup>"</sup> 9	5 <sup>s</sup> 16 <sup>s</sup> 0 <sup>"</sup> 24	22 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 6	33 <sup>s</sup> 20 <sup>s</sup> 0 <sup>"</sup> 25	18 <sup>"</sup> 5 <sup>"</sup> 1 <sup>"</sup> 1
Aug. 9	5 <sup>s</sup> 14 <sup>s</sup> 0 <sup>"</sup> 27	53 <sup>"</sup> 4 <sup>"</sup> 3 <sup>"</sup> 2	5 <sup>s</sup> 40 <sup>s</sup> 0 <sup>"</sup> 21	21 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 1	33 <sup>s</sup> 45 <sup>s</sup> 0 <sup>"</sup> 23	17 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 7
19	5 <sup>s</sup> 41 <sup>s</sup> 0 <sup>"</sup> 22	56 <sup>"</sup> 6 <sup>"</sup> 3 <sup>"</sup> 2	5 <sup>s</sup> 61 <sup>s</sup> 0 <sup>"</sup> 16	21 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 1	33 <sup>s</sup> 68 <sup>s</sup> 0 <sup>"</sup> 19	16 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 4
29	5 <sup>s</sup> 63 <sup>s</sup> 0 <sup>"</sup> 16	59 <sup>"</sup> 8 <sup>"</sup> 3 <sup>"</sup> 2	5 <sup>s</sup> 77 <sup>s</sup> 0 <sup>"</sup> 13	22 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 5	33 <sup>s</sup> 87 <sup>s</sup> 0 <sup>"</sup> 16	16 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 1
Sept. 8	5 <sup>s</sup> 79 <sup>s</sup> 0 <sup>"</sup> 10	63 <sup>"</sup> 0 <sup>"</sup> 3 <sup>"</sup> 1	5 <sup>s</sup> 90 <sup>s</sup> 0 <sup>"</sup> 09	23 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 8	34 <sup>s</sup> 03 <sup>s</sup> 0 <sup>"</sup> 13	16 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 2
18	5 <sup>s</sup> 89 <sup>s</sup> 0 <sup>"</sup> 05	66 <sup>"</sup> 1 <sup>"</sup> 2 <sup>"</sup> 9	6 <sup>s</sup> 04 <sup>s</sup> 0 <sup>"</sup> 01	24 <sup>"</sup> 1 <sup>"</sup> 1 <sup>"</sup> 2	34 <sup>s</sup> 16 <sup>s</sup> 0 <sup>"</sup> 09	16 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 5
28	5 <sup>s</sup> 94 <sup>s</sup> 0 <sup>"</sup> 01	69 <sup>"</sup> 0 <sup>"</sup> 2 <sup>"</sup> 7	6 <sup>s</sup> 05 <sup>s</sup> 0 <sup>"</sup> 02	25 <sup>"</sup> 3 <sup>"</sup> 1 <sup>"</sup> 3	34 <sup>s</sup> 25 <sup>s</sup> 0 <sup>"</sup> 05	16 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 7
Oct. 8	5 <sup>s</sup> 93 <sup>s</sup> 0 <sup>"</sup> 06	71 <sup>"</sup> 7 <sup>"</sup> 2 <sup>"</sup> 4	6 <sup>s</sup> 03 <sup>s</sup> 0 <sup>"</sup> 04	26 <sup>"</sup> 6 <sup>"</sup> 1 <sup>"</sup> 4	34 <sup>s</sup> 30 <sup>s</sup> 0 <sup>"</sup> 03	17 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 7
18	5 <sup>s</sup> 87 <sup>s</sup> 0 <sup>"</sup> 11	74 <sup>"</sup> 1 <sup>"</sup> 2 <sup>"</sup> 0	5 <sup>s</sup> 99 <sup>s</sup> 0 <sup>"</sup> 07	28 <sup>"</sup> 0 <sup>"</sup> 1 <sup>"</sup> 4	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
28	5 <sup>s</sup> 76 <sup>s</sup> 0 <sup>"</sup> 15	76 <sup>"</sup> 1 <sup>"</sup> 1 <sup>"</sup> 7	5 <sup>s</sup> 92 <sup>s</sup> 0 <sup>"</sup> 10	29 <sup>"</sup> 4 <sup>"</sup> 1 <sup>"</sup> 3	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
Nov. 7	5 <sup>s</sup> 61 <sup>s</sup> 0 <sup>"</sup> 23	77 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 7	5 <sup>s</sup> 82 <sup>s</sup> 0 <sup>"</sup> 10	30 <sup>"</sup> 7 <sup>"</sup> 1 <sup>"</sup> 2	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
17	5 <sup>s</sup> 41 <sup>s</sup> 0 <sup>"</sup> 26	79 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 3	5 <sup>s</sup> 72 <sup>s</sup> 0 <sup>"</sup> 12	31 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 8	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
27	5 <sup>s</sup> 18 <sup>s</sup> 0 <sup>"</sup> 28	80 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 4	5 <sup>s</sup> 60 <sup>s</sup> 0 <sup>"</sup> 13	32 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 6	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
Dec. 7	4 <sup>s</sup> 92 <sup>s</sup> 0 <sup>"</sup> 29	79 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 4	5 <sup>s</sup> 47 <sup>s</sup> 0 <sup>"</sup> 13	33 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 6	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
17	4 <sup>s</sup> 64 <sup>s</sup> 0 <sup>"</sup> 29	79 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 4	5 <sup>s</sup> 34 <sup>s</sup> 0 <sup>"</sup> 13	34 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 6	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
27	4 <sup>s</sup> 35 <sup>s</sup> 0 <sup>"</sup> 29	79 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 4	5 <sup>s</sup> 34 <sup>s</sup> 0 <sup>"</sup> 13	34 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 6	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	
37	4 <sup>s</sup> 35 <sup>s</sup> 0 <sup>"</sup> 29	79 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 4	5 <sup>s</sup> 34 <sup>s</sup> 0 <sup>"</sup> 13	34 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 6	34 <sup>s</sup> 33 <sup>s</sup> 0 <sup>"</sup> 00	



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ Eridani. (Achernar)		$\alpha$ ARIETIS.		$\gamma$ Ceti.	
	R. A.	Dec. South.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 1 <sup>m</sup> 32	<sup>o</sup> 57 <sup>'</sup> 59	<sup>h</sup> 1 <sup>m</sup> 58	<sup>o</sup> 22 <sup>'</sup> 44	<sup>h</sup> 2 <sup>m</sup> 35	<sup>o</sup> 2 <sup>'</sup> 3
Jan. 1	6 <sup>s</sup> 65 <sup>s</sup>	84 <sup>s</sup> 4 <sup>s</sup>	43 <sup>s</sup> 65 <sup>s</sup>	60 <sup>s</sup> 9 <sup>s</sup>	32 <sup>s</sup> 00 <sup>s</sup>	53 <sup>s</sup> 3 <sup>s</sup>
11	6 <sup>s</sup> 32 <sup>s</sup>	84 <sup>s</sup> 8 <sup>s</sup>	43 <sup>s</sup> 51 <sup>s</sup>	60 <sup>s</sup> 5 <sup>s</sup>	31 <sup>s</sup> 89 <sup>s</sup>	52 <sup>s</sup> 6 <sup>s</sup>
21	5 <sup>s</sup> 98 <sup>s</sup>	84 <sup>s</sup> 6 <sup>s</sup>	43 <sup>s</sup> 36 <sup>s</sup>	59 <sup>s</sup> 9 <sup>s</sup>	31 <sup>s</sup> 77 <sup>s</sup>	51 <sup>s</sup> 9 <sup>s</sup>
31	5 <sup>s</sup> 66 <sup>s</sup>	83 <sup>s</sup> 8 <sup>s</sup>	43 <sup>s</sup> 21 <sup>s</sup>	59 <sup>s</sup> 3 <sup>s</sup>	31 <sup>s</sup> 62 <sup>s</sup>	51 <sup>s</sup> 3 <sup>s</sup>
	0 <sup>s</sup> 31	1 <sup>s</sup> 3	0 <sup>s</sup> 16	0 <sup>s</sup> 8	0 <sup>s</sup> 15	0 <sup>s</sup> 5
Feb. 10	5 <sup>s</sup> 35 <sup>s</sup>	82 <sup>s</sup> 5 <sup>s</sup>	43 <sup>s</sup> 05 <sup>s</sup>	58 <sup>s</sup> 5 <sup>s</sup>	31 <sup>s</sup> 47 <sup>s</sup>	50 <sup>s</sup> 8 <sup>s</sup>
20	5 <sup>s</sup> 06 <sup>s</sup>	80 <sup>s</sup> 7 <sup>s</sup>	42 <sup>s</sup> 89 <sup>s</sup>	57 <sup>s</sup> 6 <sup>s</sup>	31 <sup>s</sup> 32 <sup>s</sup>	50 <sup>s</sup> 5 <sup>s</sup>
Mar. 2	4 <sup>s</sup> 81 <sup>s</sup>	78 <sup>s</sup> 4 <sup>s</sup>	42 <sup>s</sup> 75 <sup>s</sup>	56 <sup>s</sup> 6 <sup>s</sup>	31 <sup>s</sup> 17 <sup>s</sup>	50 <sup>s</sup> 2 <sup>s</sup>
2	4 <sup>s</sup> 60 <sup>s</sup>	75 <sup>s</sup> 8 <sup>s</sup>	42 <sup>s</sup> 64 <sup>s</sup>	55 <sup>s</sup> 6 <sup>s</sup>	31 <sup>s</sup> 04 <sup>s</sup>	50 <sup>s</sup> 2 <sup>s</sup>
	0 <sup>s</sup> 15	3 <sup>s</sup> 0	0 <sup>s</sup> 09	0 <sup>s</sup> 9	0 <sup>s</sup> 11	0 <sup>s</sup> 1
22	4 <sup>s</sup> 45 <sup>s</sup>	72 <sup>s</sup> 8 <sup>s</sup>	42 <sup>s</sup> 55 <sup>s</sup>	54 <sup>s</sup> 7 <sup>s</sup>	30 <sup>s</sup> 93 <sup>s</sup>	50 <sup>s</sup> 3 <sup>s</sup>
Apr. 1	4 <sup>s</sup> 36 <sup>s</sup>	69 <sup>s</sup> 6 <sup>s</sup>	42 <sup>s</sup> 51 <sup>s</sup>	54 <sup>s</sup> 0 <sup>s</sup>	30 <sup>s</sup> 86 <sup>s</sup>	50 <sup>s</sup> 5 <sup>s</sup>
11	4 <sup>s</sup> 34 <sup>s</sup>	66 <sup>s</sup> 2 <sup>s</sup>	42 <sup>s</sup> 51 <sup>s</sup>	53 <sup>s</sup> 3 <sup>s</sup>	30 <sup>s</sup> 82 <sup>s</sup>	51 <sup>s</sup> 0 <sup>s</sup>
21	4 <sup>s</sup> 39 <sup>s</sup>	62 <sup>s</sup> 3 <sup>s</sup>	42 <sup>s</sup> 56 <sup>s</sup>	52 <sup>s</sup> 8 <sup>s</sup>	30 <sup>s</sup> 83 <sup>s</sup>	51 <sup>s</sup> 7 <sup>s</sup>
	0 <sup>s</sup> 12	3 <sup>s</sup> 6	0 <sup>s</sup> 10	0 <sup>s</sup> 2	0 <sup>s</sup> 04	1 <sup>s</sup> 0
May 1	4 <sup>s</sup> 51 <sup>s</sup>	58 <sup>s</sup> 7 <sup>s</sup>	42 <sup>s</sup> 66 <sup>s</sup>	52 <sup>s</sup> 6 <sup>s</sup>	30 <sup>s</sup> 87 <sup>s</sup>	52 <sup>s</sup> 7 <sup>s</sup>
11	4 <sup>s</sup> 70 <sup>s</sup>	55 <sup>s</sup> 2 <sup>s</sup>	42 <sup>s</sup> 81 <sup>s</sup>	52 <sup>s</sup> 7 <sup>s</sup>	30 <sup>s</sup> 98 <sup>s</sup>	53 <sup>s</sup> 9 <sup>s</sup>
21	4 <sup>s</sup> 96 <sup>s</sup>	51 <sup>s</sup> 8 <sup>s</sup>	43 <sup>s</sup> 00 <sup>s</sup>	53 <sup>s</sup> 0 <sup>s</sup>	31 <sup>s</sup> 12 <sup>s</sup>	55 <sup>s</sup> 3 <sup>s</sup>
31	5 <sup>s</sup> 28 <sup>s</sup>	48 <sup>s</sup> 5 <sup>s</sup>	43 <sup>s</sup> 23 <sup>s</sup>	53 <sup>s</sup> 6 <sup>s</sup>	31 <sup>s</sup> 30 <sup>s</sup>	56 <sup>s</sup> 8 <sup>s</sup>
	0 <sup>s</sup> 38	2 <sup>s</sup> 9	0 <sup>s</sup> 27	0 <sup>s</sup> 9	0 <sup>s</sup> 22	1 <sup>s</sup> 7
June 10	5 <sup>s</sup> 66 <sup>s</sup>	45 <sup>s</sup> 6 <sup>s</sup>	43 <sup>s</sup> 50 <sup>s</sup>	54 <sup>s</sup> 5 <sup>s</sup>	31 <sup>s</sup> 52 <sup>s</sup>	58 <sup>s</sup> 5 <sup>s</sup>
20	6 <sup>s</sup> 08 <sup>s</sup>	43 <sup>s</sup> 0 <sup>s</sup>	43 <sup>s</sup> 79 <sup>s</sup>	55 <sup>s</sup> 6 <sup>s</sup>	31 <sup>s</sup> 77 <sup>s</sup>	60 <sup>s</sup> 2 <sup>s</sup>
30	6 <sup>s</sup> 53 <sup>s</sup>	40 <sup>s</sup> 8 <sup>s</sup>	44 <sup>s</sup> 10 <sup>s</sup>	57 <sup>s</sup> 0 <sup>s</sup>	32 <sup>s</sup> 05 <sup>s</sup>	62 <sup>s</sup> 0 <sup>s</sup>
July 10	7 <sup>s</sup> 00 <sup>s</sup>	39 <sup>s</sup> 1 <sup>s</sup>	44 <sup>s</sup> 42 <sup>s</sup>	58 <sup>s</sup> 5 <sup>s</sup>	32 <sup>s</sup> 34 <sup>s</sup>	63 <sup>s</sup> 9 <sup>s</sup>
	0 <sup>s</sup> 48	1 <sup>s</sup> 2	0 <sup>s</sup> 33	1 <sup>s</sup> 7	0 <sup>s</sup> 30	1 <sup>s</sup> 8
20	7 <sup>s</sup> 48 <sup>s</sup>	37 <sup>s</sup> 9 <sup>s</sup>	44 <sup>s</sup> 75 <sup>s</sup>	60 <sup>s</sup> 2 <sup>s</sup>	32 <sup>s</sup> 64 <sup>s</sup>	65 <sup>s</sup> 7 <sup>s</sup>
30	7 <sup>s</sup> 96 <sup>s</sup>	37 <sup>s</sup> 3 <sup>s</sup>	45 <sup>s</sup> 07 <sup>s</sup>	61 <sup>s</sup> 9 <sup>s</sup>	32 <sup>s</sup> 94 <sup>s</sup>	67 <sup>s</sup> 4 <sup>s</sup>
Aug. 9	8 <sup>s</sup> 42 <sup>s</sup>	37 <sup>s</sup> 2 <sup>s</sup>	45 <sup>s</sup> 37 <sup>s</sup>	63 <sup>s</sup> 7 <sup>s</sup>	33 <sup>s</sup> 23 <sup>s</sup>	68 <sup>s</sup> 9 <sup>s</sup>
19	8 <sup>s</sup> 85 <sup>s</sup>	37 <sup>s</sup> 7 <sup>s</sup>	45 <sup>s</sup> 66 <sup>s</sup>	65 <sup>s</sup> 5 <sup>s</sup>	33 <sup>s</sup> 51 <sup>s</sup>	70 <sup>s</sup> 3 <sup>s</sup>
	0 <sup>s</sup> 39	1 <sup>s</sup> 0	0 <sup>s</sup> 27	1 <sup>s</sup> 8	0 <sup>s</sup> 27	1 <sup>s</sup> 2
29	9 <sup>s</sup> 24 <sup>s</sup>	38 <sup>s</sup> 7 <sup>s</sup>	45 <sup>s</sup> 93 <sup>s</sup>	67 <sup>s</sup> 3 <sup>s</sup>	33 <sup>s</sup> 78 <sup>s</sup>	71 <sup>s</sup> 5 <sup>s</sup>
Sept. 8	9 <sup>s</sup> 58 <sup>s</sup>	40 <sup>s</sup> 3 <sup>s</sup>	46 <sup>s</sup> 17 <sup>s</sup>	69 <sup>s</sup> 1 <sup>s</sup>	34 <sup>s</sup> 03 <sup>s</sup>	72 <sup>s</sup> 4 <sup>s</sup>
18	9 <sup>s</sup> 85 <sup>s</sup>	42 <sup>s</sup> 3 <sup>s</sup>	46 <sup>s</sup> 38 <sup>s</sup>	70 <sup>s</sup> 7 <sup>s</sup>	34 <sup>s</sup> 25 <sup>s</sup>	73 <sup>s</sup> 1 <sup>s</sup>
28	10 <sup>s</sup> 06 <sup>s</sup>	44 <sup>s</sup> 7 <sup>s</sup>	46 <sup>s</sup> 56 <sup>s</sup>	72 <sup>s</sup> 1 <sup>s</sup>	34 <sup>s</sup> 44 <sup>s</sup>	73 <sup>s</sup> 5 <sup>s</sup>
	0 <sup>s</sup> 14	2 <sup>s</sup> 7	0 <sup>s</sup> 14	1 <sup>s</sup> 4	0 <sup>s</sup> 17	0 <sup>s</sup> 1
Oct. 8	10 <sup>s</sup> 20 <sup>s</sup>	47 <sup>s</sup> 4 <sup>s</sup>	46 <sup>s</sup> 70 <sup>s</sup>	73 <sup>s</sup> 5 <sup>s</sup>	34 <sup>s</sup> 61 <sup>s</sup>	73 <sup>s</sup> 6 <sup>s</sup>
18	10 <sup>s</sup> 27 <sup>s</sup>	50 <sup>s</sup> 2 <sup>s</sup>	46 <sup>s</sup> 81 <sup>s</sup>	74 <sup>s</sup> 6 <sup>s</sup>	34 <sup>s</sup> 75 <sup>s</sup>	73 <sup>s</sup> 5 <sup>s</sup>
28	10 <sup>s</sup> 27 <sup>s</sup>	53 <sup>s</sup> 2 <sup>s</sup>	46 <sup>s</sup> 89 <sup>s</sup>	75 <sup>s</sup> 6 <sup>s</sup>	34 <sup>s</sup> 86 <sup>s</sup>	73 <sup>s</sup> 2 <sup>s</sup>
Nov. 7	10 <sup>s</sup> 20 <sup>s</sup>	56 <sup>s</sup> 1 <sup>s</sup>	46 <sup>s</sup> 94 <sup>s</sup>	76 <sup>s</sup> 5 <sup>s</sup>	34 <sup>s</sup> 94 <sup>s</sup>	72 <sup>s</sup> 8 <sup>s</sup>
	0 <sup>s</sup> 13	2 <sup>s</sup> 7	0 <sup>s</sup> 01	0 <sup>s</sup> 6	0 <sup>s</sup> 04	0 <sup>s</sup> 6
17	10 <sup>s</sup> 07 <sup>s</sup>	58 <sup>s</sup> 8 <sup>s</sup>	46 <sup>s</sup> 95 <sup>s</sup>	77 <sup>s</sup> 1 <sup>s</sup>	34 <sup>s</sup> 98 <sup>s</sup>	72 <sup>s</sup> 2 <sup>s</sup>
27	9 <sup>s</sup> 89 <sup>s</sup>	61 <sup>s</sup> 3 <sup>s</sup>	46 <sup>s</sup> 94 <sup>s</sup>	77 <sup>s</sup> 6 <sup>s</sup>	35 <sup>s</sup> 00 <sup>s</sup>	71 <sup>s</sup> 5 <sup>s</sup>
Dec. 7	9 <sup>s</sup> 65 <sup>s</sup>	63 <sup>s</sup> 4 <sup>s</sup>	46 <sup>s</sup> 90 <sup>s</sup>	77 <sup>s</sup> 9 <sup>s</sup>	34 <sup>s</sup> 99 <sup>s</sup>	70 <sup>s</sup> 7 <sup>s</sup>
17	9 <sup>s</sup> 38 <sup>s</sup>	65 <sup>s</sup> 1 <sup>s</sup>	46 <sup>s</sup> 83 <sup>s</sup>	78 <sup>s</sup> 0 <sup>s</sup>	34 <sup>s</sup> 95 <sup>s</sup>	69 <sup>s</sup> 9 <sup>s</sup>
	0 <sup>s</sup> 30	1 <sup>s</sup> 2	0 <sup>s</sup> 10	0 <sup>s</sup> 1	0 <sup>s</sup> 07	0 <sup>s</sup> 7
27	9 <sup>s</sup> 08 <sup>s</sup>	66 <sup>s</sup> 3 <sup>s</sup>	46 <sup>s</sup> 73 <sup>s</sup>	77 <sup>s</sup> 9 <sup>s</sup>	34 <sup>s</sup> 88 <sup>s</sup>	69 <sup>s</sup> 2 <sup>s</sup>
37	8 <sup>s</sup> 76 <sup>s</sup>	66 <sup>s</sup> 9 <sup>s</sup>	46 <sup>s</sup> 61 <sup>s</sup>	77 <sup>s</sup> 6 <sup>s</sup>	34 <sup>s</sup> 79 <sup>s</sup>	68 <sup>s</sup> 4 <sup>s</sup>



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ CETI.		$\alpha$ PERSEI.		$\eta$ Tauri.	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 2 <sup>m</sup> 54	<sup>o</sup> 3 <sup>'</sup> 29	<sup>h</sup> 3 <sup>m</sup> 13	<sup>o</sup> 49 <sup>'</sup> 19	<sup>h</sup> 3 <sup>m</sup> 38	<sup>o</sup> 23 <sup>'</sup> 38
Jan. 1	26 <sup>s</sup> .77 <sup>s</sup>	43 <sup>"</sup> .7 <sup>"</sup>	39 <sup>s</sup> .21 <sup>s</sup>	22 <sup>"</sup> .9 <sup>"</sup>	35 <sup>s</sup> .07 <sup>s</sup>	9 <sup>"</sup> .0 <sup>"</sup>
11	26 <sup>0</sup> .67 <sup>0</sup> .10	43 <sup>0</sup> .0 <sup>0</sup> .7	39 <sup>0</sup> .04 <sup>0</sup> .17	23 <sup>0</sup> .9 <sup>0</sup> .10	34 <sup>0</sup> .98 <sup>0</sup> .09	9 <sup>0</sup> .0 <sup>0</sup> .0
21	26 <sup>0</sup> .55 <sup>0</sup> .12	42 <sup>0</sup> .3 <sup>0</sup> .7	38 <sup>0</sup> .83 <sup>0</sup> .21	24 <sup>0</sup> .5 <sup>0</sup> .6	34 <sup>0</sup> .87 <sup>0</sup> .11	9 <sup>0</sup> .0 <sup>0</sup> .0
31	26 <sup>0</sup> .41 <sup>0</sup> .14	41 <sup>0</sup> .8 <sup>0</sup> .5	38 <sup>0</sup> .59 <sup>0</sup> .24	24 <sup>0</sup> .7 <sup>0</sup> .2	34 <sup>0</sup> .72 <sup>0</sup> .15	8 <sup>0</sup> .8 <sup>0</sup> .2
	0 <sup>1</sup> .6	0 <sup>1</sup> .5	0 <sup>1</sup> .26	0 <sup>1</sup> .2	0 <sup>1</sup> .17	0 <sup>1</sup> .3
Feb. 10	26 <sup>0</sup> .25 <sup>0</sup> .16	41 <sup>0</sup> .3 <sup>0</sup> .4	38 <sup>0</sup> .33 <sup>0</sup> .27	24 <sup>0</sup> .5 <sup>0</sup> .5	34 <sup>0</sup> .55 <sup>0</sup> .18	8 <sup>0</sup> .5 <sup>0</sup> .4
20	26 <sup>0</sup> .09 <sup>0</sup> .15	40 <sup>0</sup> .9 <sup>0</sup> .2	38 <sup>0</sup> .06 <sup>0</sup> .27	24 <sup>0</sup> .0 <sup>0</sup> .9	34 <sup>0</sup> .37 <sup>0</sup> .18	8 <sup>0</sup> .1 <sup>0</sup> .5
Mar. 2	25 <sup>0</sup> .94 <sup>0</sup> .14	40 <sup>0</sup> .7 <sup>0</sup> .1	37 <sup>0</sup> .79 <sup>0</sup> .25	23 <sup>0</sup> .1 <sup>0</sup> .2	34 <sup>0</sup> .19 <sup>0</sup> .18	7 <sup>0</sup> .6 <sup>0</sup> .5
12	25 <sup>0</sup> .80 <sup>0</sup> .12	40 <sup>0</sup> .6 <sup>0</sup> .0	37 <sup>0</sup> .54 <sup>0</sup> .21	21 <sup>0</sup> .9 <sup>0</sup> .4	34 <sup>0</sup> .01 <sup>0</sup> .16	7 <sup>0</sup> .1 <sup>0</sup> .6
	0 <sup>1</sup> .2	0 <sup>1</sup> .0	0 <sup>1</sup> .21	1 <sup>1</sup> .4	0 <sup>1</sup> .6	0 <sup>1</sup> .6
22	25 <sup>0</sup> .68 <sup>0</sup> .09	40 <sup>0</sup> .6 <sup>0</sup> .3	37 <sup>0</sup> .33 <sup>0</sup> .17	20 <sup>0</sup> .5 <sup>0</sup> .7	33 <sup>0</sup> .85 <sup>0</sup> .13	6 <sup>0</sup> .5 <sup>0</sup> .5
Apr. 1	25 <sup>0</sup> .59 <sup>0</sup> .06	40 <sup>0</sup> .9 <sup>0</sup> .4	37 <sup>0</sup> .16 <sup>0</sup> .12	18 <sup>0</sup> .8 <sup>0</sup> .7	33 <sup>0</sup> .72 <sup>0</sup> .10	6 <sup>0</sup> .0 <sup>0</sup> .6
11	25 <sup>0</sup> .53 <sup>0</sup> .01	41 <sup>0</sup> .3 <sup>0</sup> .6	37 <sup>0</sup> .04 <sup>0</sup> .06	17 <sup>0</sup> .1 <sup>0</sup> .8	33 <sup>0</sup> .62 <sup>0</sup> .05	5 <sup>0</sup> .4 <sup>0</sup> .5
21	25 <sup>0</sup> .52 <sup>0</sup> .03	41 <sup>0</sup> .9 <sup>0</sup> .9	36 <sup>0</sup> .98 <sup>0</sup> .02	15 <sup>0</sup> .3 <sup>0</sup> .7	33 <sup>0</sup> .57 <sup>0</sup> .01	4 <sup>0</sup> .9 <sup>0</sup> .3
	0 <sup>1</sup> .3	0 <sup>1</sup> .9	0 <sup>1</sup> .02	1 <sup>1</sup> .7	0 <sup>1</sup> .0	0 <sup>1</sup> .4
May 1	25 <sup>0</sup> .55 <sup>0</sup> .09	42 <sup>0</sup> .8 <sup>0</sup> .1	37 <sup>0</sup> .00 <sup>0</sup> .08	13 <sup>0</sup> .6 <sup>0</sup> .8	33 <sup>0</sup> .56 <sup>0</sup> .04	4 <sup>0</sup> .6 <sup>0</sup> .2
11	25 <sup>0</sup> .64 <sup>0</sup> .12	43 <sup>0</sup> .9 <sup>0</sup> .3	37 <sup>0</sup> .08 <sup>0</sup> .17	11 <sup>0</sup> .8 <sup>0</sup> .4	33 <sup>0</sup> .60 <sup>0</sup> .11	4 <sup>0</sup> .4 <sup>0</sup> .1
21	25 <sup>0</sup> .76 <sup>0</sup> .17	45 <sup>0</sup> .2 <sup>0</sup> .4	37 <sup>0</sup> .25 <sup>0</sup> .22	10 <sup>0</sup> .4 <sup>0</sup> .1	33 <sup>0</sup> .71 <sup>0</sup> .15	4 <sup>0</sup> .3 <sup>0</sup> .2
31	25 <sup>0</sup> .93 <sup>0</sup> .21	46 <sup>0</sup> .6 <sup>0</sup> .6	37 <sup>0</sup> .47 <sup>0</sup> .27	9 <sup>0</sup> .3 <sup>0</sup> .9	33 <sup>0</sup> .86 <sup>0</sup> .19	4 <sup>0</sup> .5 <sup>0</sup> .4
	0 <sup>1</sup> .6	1 <sup>1</sup> .6	0 <sup>1</sup> .27	0 <sup>1</sup> .9	0 <sup>1</sup> .9	0 <sup>1</sup> .4
June 10	26 <sup>0</sup> .14 <sup>0</sup> .24	48 <sup>0</sup> .2 <sup>0</sup> .7	37 <sup>0</sup> .74 <sup>0</sup> .33	8 <sup>0</sup> .4 <sup>0</sup> .6	34 <sup>0</sup> .05 <sup>0</sup> .23	4 <sup>0</sup> .9 <sup>0</sup> .5
20	26 <sup>0</sup> .38 <sup>0</sup> .26	49 <sup>0</sup> .9 <sup>0</sup> .7	38 <sup>0</sup> .07 <sup>0</sup> .36	7 <sup>0</sup> .8 <sup>0</sup> .2	34 <sup>0</sup> .28 <sup>0</sup> .26	5 <sup>0</sup> .4 <sup>0</sup> .7
30	26 <sup>0</sup> .64 <sup>0</sup> .28	51 <sup>0</sup> .6 <sup>0</sup> .8	38 <sup>0</sup> .43 <sup>0</sup> .40	7 <sup>0</sup> .6 <sup>0</sup> .1	34 <sup>0</sup> .54 <sup>0</sup> .29	6 <sup>0</sup> .1 <sup>0</sup> .9
July 10	26 <sup>0</sup> .92 <sup>0</sup> .30	53 <sup>0</sup> .4 <sup>0</sup> .8	38 <sup>0</sup> .83 <sup>0</sup> .41	7 <sup>0</sup> .7 <sup>0</sup> .4	34 <sup>0</sup> .83 <sup>0</sup> .30	7 <sup>0</sup> .0 <sup>0</sup> .1
	0 <sup>1</sup> .8	1 <sup>1</sup> .8	0 <sup>1</sup> .41	0 <sup>1</sup> .4	0 <sup>1</sup> .30	1 <sup>1</sup> .1
20	27 <sup>0</sup> .22 <sup>0</sup> .30	55 <sup>0</sup> .2 <sup>0</sup> .6	39 <sup>0</sup> .24 <sup>0</sup> .43	8 <sup>0</sup> .1 <sup>0</sup> .7	35 <sup>0</sup> .13 <sup>0</sup> .32	8 <sup>0</sup> .1 <sup>0</sup> .1
30	27 <sup>0</sup> .52 <sup>0</sup> .29	56 <sup>0</sup> .8 <sup>0</sup> .6	39 <sup>0</sup> .67 <sup>0</sup> .43	8 <sup>0</sup> .8 <sup>0</sup> .0	35 <sup>0</sup> .45 <sup>0</sup> .32	9 <sup>0</sup> .2 <sup>0</sup> .1
Aug. 9	27 <sup>0</sup> .81 <sup>0</sup> .29	58 <sup>0</sup> .4 <sup>0</sup> .3	40 <sup>0</sup> .10 <sup>0</sup> .42	9 <sup>0</sup> .8 <sup>0</sup> .3	35 <sup>0</sup> .77 <sup>0</sup> .32	10 <sup>0</sup> .4 <sup>0</sup> .1
19	28 <sup>0</sup> .10 <sup>0</sup> .27	59 <sup>0</sup> .7 <sup>0</sup> .2	40 <sup>0</sup> .52 <sup>0</sup> .41	11 <sup>0</sup> .1 <sup>0</sup> .5	36 <sup>0</sup> .09 <sup>0</sup> .31	11 <sup>0</sup> .6 <sup>0</sup> .1
	0 <sup>1</sup> .2	1 <sup>1</sup> .2	0 <sup>1</sup> .41	1 <sup>1</sup> .5	0 <sup>1</sup> .31	1 <sup>1</sup> .2
29	28 <sup>0</sup> .37 <sup>0</sup> .26	60 <sup>0</sup> .9 <sup>0</sup> .9	40 <sup>0</sup> .93 <sup>0</sup> .38	12 <sup>0</sup> .6 <sup>0</sup> .8	36 <sup>0</sup> .40 <sup>0</sup> .29	12 <sup>0</sup> .8 <sup>0</sup> .1
Sept. 8	28 <sup>0</sup> .63 <sup>0</sup> .24	61 <sup>0</sup> .8 <sup>0</sup> .7	41 <sup>0</sup> .31 <sup>0</sup> .36	14 <sup>0</sup> .4 <sup>0</sup> .9	36 <sup>0</sup> .69 <sup>0</sup> .29	14 <sup>0</sup> .0 <sup>0</sup> .1
18	28 <sup>0</sup> .87 <sup>0</sup> .21	62 <sup>0</sup> .5 <sup>0</sup> .4	41 <sup>0</sup> .67 <sup>0</sup> .33	16 <sup>0</sup> .3 <sup>0</sup> .0	36 <sup>0</sup> .98 <sup>0</sup> .26	15 <sup>0</sup> .1 <sup>0</sup> .0
28	29 <sup>0</sup> .08 <sup>0</sup> .18	62 <sup>0</sup> .9 <sup>0</sup> .2	42 <sup>0</sup> .00 <sup>0</sup> .30	18 <sup>0</sup> .3 <sup>0</sup> .1	37 <sup>0</sup> .24 <sup>0</sup> .24	16 <sup>0</sup> .1 <sup>0</sup> .0
	0 <sup>1</sup> .8	0 <sup>1</sup> .2	0 <sup>1</sup> .30	2 <sup>1</sup> .1	0 <sup>1</sup> .24	1 <sup>1</sup> .0
Oct. 8	29 <sup>0</sup> .26 <sup>0</sup> .16	63 <sup>0</sup> .1 <sup>0</sup> .1	42 <sup>0</sup> .30 <sup>0</sup> .26	20 <sup>0</sup> .4 <sup>0</sup> .2	37 <sup>0</sup> .48 <sup>0</sup> .21	17 <sup>0</sup> .1 <sup>0</sup> .0
18	29 <sup>0</sup> .42 <sup>0</sup> .12	63 <sup>0</sup> .0 <sup>0</sup> .3	42 <sup>0</sup> .56 <sup>0</sup> .22	22 <sup>0</sup> .6 <sup>0</sup> .2	37 <sup>0</sup> .69 <sup>0</sup> .19	18 <sup>0</sup> .0 <sup>0</sup> .0
28	29 <sup>0</sup> .54 <sup>0</sup> .10	62 <sup>0</sup> .7 <sup>0</sup> .4	42 <sup>0</sup> .78 <sup>0</sup> .17	24 <sup>0</sup> .8 <sup>0</sup> .2	37 <sup>0</sup> .88 <sup>0</sup> .17	0 <sup>1</sup> .7
Nov. 7	29 <sup>0</sup> .64 <sup>0</sup> .07	62 <sup>0</sup> .3 <sup>0</sup> .6	42 <sup>0</sup> .95 <sup>0</sup> .12	27 <sup>0</sup> .0 <sup>0</sup> .1	38 <sup>0</sup> .04 <sup>0</sup> .0	0 <sup>1</sup> .7
	0 <sup>1</sup> .7	0 <sup>1</sup> .6	0 <sup>1</sup> .12	2 <sup>1</sup> .1	0 <sup>1</sup> .0	0 <sup>1</sup> .7
17	29 <sup>0</sup> .71 <sup>0</sup> .04	61 <sup>0</sup> .7 <sup>0</sup> .6	43 <sup>0</sup> .07 <sup>0</sup> .07	29 <sup>0</sup> .1 <sup>0</sup> .0	38 <sup>0</sup> .17 <sup>0</sup> .0	0 <sup>1</sup> .7
27	29 <sup>0</sup> .75 <sup>0</sup> .00	61 <sup>0</sup> .1 <sup>0</sup> .8	43 <sup>0</sup> .14 <sup>0</sup> .02	31 <sup>0</sup> .1 <sup>0</sup> .9	38 <sup>0</sup> .24 <sup>0</sup> .0	0 <sup>1</sup> .7
Dec. 7	29 <sup>0</sup> .75 <sup>0</sup> .02	60 <sup>0</sup> .3 <sup>0</sup> .7	43 <sup>0</sup> .16 <sup>0</sup> .03	33 <sup>0</sup> .0 <sup>0</sup> .7	38 <sup>0</sup> .31 <sup>0</sup> .0	0 <sup>1</sup> .7
17	29 <sup>0</sup> .73 <sup>0</sup> .06	59 <sup>0</sup> .6 <sup>0</sup> .8	43 <sup>0</sup> .13 <sup>0</sup> .09	34 <sup>0</sup> .7 <sup>0</sup> .4	38 <sup>0</sup> .38 <sup>0</sup> .0	0 <sup>1</sup> .7
	0 <sup>1</sup> .6	0 <sup>1</sup> .8	0 <sup>1</sup> .09	1 <sup>1</sup> .4	0 <sup>1</sup> .0	0 <sup>1</sup> .7
27	29 <sup>0</sup> .67 <sup>0</sup> .08	58 <sup>0</sup> .8 <sup>0</sup> .7	43 <sup>0</sup> .04 <sup>0</sup> .13	36 <sup>0</sup> .1 <sup>0</sup> .1	38 <sup>0</sup> .45 <sup>0</sup> .0	0 <sup>1</sup> .7
37	29 <sup>0</sup> .59 <sup>0</sup> .08	58 <sup>0</sup> .1 <sup>0</sup> .7	42 <sup>0</sup> .91 <sup>0</sup> .13	37 <sup>0</sup> .2 <sup>0</sup> .1	38 <sup>0</sup> .52 <sup>0</sup> .0	0 <sup>1</sup> .7



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\gamma^1$ Eridani.		$\alpha$ TAURI. (Aldebaran)		$\alpha$ AURIGÆ. (Capella)	
	R. A.	Dec. South.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 3 <sup>m</sup> 51	<sup>°</sup> 13 <sup>'</sup> 56	<sup>h</sup> 4 <sup>m</sup> 27	<sup>°</sup> 16 <sup>'</sup> 12	<sup>h</sup> 5 <sup>m</sup> 5	<sup>°</sup> 45 <sup>'</sup> 50
Jan. 1	2 <sup>s</sup> 34 <sup>s</sup> 0 <sup>s</sup> 09	33 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 4	19 <sup>s</sup> 68 <sup>s</sup> 0 <sup>s</sup> 04	3 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 2	38 <sup>s</sup> 01 <sup>s</sup> 0 <sup>s</sup> 03	16 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 4
11	2 <sup>s</sup> 25 <sup>s</sup> 0 <sup>s</sup> 11	34 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 1	19 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 08	3 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 2	37 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 08	17 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 2
21	2 <sup>s</sup> 14 <sup>s</sup> 0 <sup>s</sup> 15	35 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 9	19 <sup>s</sup> 56 <sup>s</sup> 0 <sup>s</sup> 12	3 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 2	37 <sup>s</sup> 90 <sup>s</sup> 0 <sup>s</sup> 15	19 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 1
31	1 <sup>s</sup> 99 <sup>s</sup> 0 <sup>s</sup> 16	36 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 6	19 <sup>s</sup> 44 <sup>s</sup> 0 <sup>s</sup> 15	3 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 3	37 <sup>s</sup> 75 <sup>s</sup> 0 <sup>s</sup> 19	20 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 8
Feb. 10	1 <sup>s</sup> 83 <sup>s</sup> 0 <sup>s</sup> 18	37 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 4	19 <sup>s</sup> 29 <sup>s</sup> 0 <sup>s</sup> 17	2 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 2	37 <sup>s</sup> 56 <sup>s</sup> 0 <sup>s</sup> 23	20 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 5
20	1 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 18	37 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 0	19 <sup>s</sup> 12 <sup>s</sup> 0 <sup>s</sup> 18	2 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 2	37 <sup>s</sup> 33 <sup>s</sup> 0 <sup>s</sup> 25	21 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 2
Mar. 2	1 <sup>s</sup> 47 <sup>s</sup> 0 <sup>s</sup> 18	37 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 3	18 <sup>s</sup> 94 <sup>s</sup> 0 <sup>s</sup> 18	2 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 3	37 <sup>s</sup> 08 <sup>s</sup> 0 <sup>s</sup> 26	21 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 1
12	1 <sup>s</sup> 29 <sup>s</sup> 0 <sup>s</sup> 17	37 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 5	18 <sup>s</sup> 76 <sup>s</sup> 0 <sup>s</sup> 17	2 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 2	36 <sup>s</sup> 82 <sup>s</sup> 0 <sup>s</sup> 26	21 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 4
22	1 <sup>s</sup> 12 <sup>s</sup> 0 <sup>s</sup> 14	37 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 9	18 <sup>s</sup> 59 <sup>s</sup> 0 <sup>s</sup> 16	2 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 2	36 <sup>s</sup> 56 <sup>s</sup> 0 <sup>s</sup> 24	21 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 6
Apr. 1	0 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 11	36 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 2	18 <sup>s</sup> 43 <sup>s</sup> 0 <sup>s</sup> 13	1 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 1	36 <sup>s</sup> 32 <sup>s</sup> 0 <sup>s</sup> 21	20 <sup>s</sup> 3 <sup>s</sup> 0 <sup>s</sup> 9
11	0 <sup>s</sup> 87 <sup>s</sup> 0 <sup>s</sup> 07	34 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 4	18 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 09	1 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 1	36 <sup>s</sup> 11 <sup>s</sup> 0 <sup>s</sup> 17	19 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 1
21	0 <sup>s</sup> 80 <sup>s</sup> 0 <sup>s</sup> 04	33 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 6	18 <sup>s</sup> 21 <sup>s</sup> 0 <sup>s</sup> 05	1 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 1	35 <sup>s</sup> 94 <sup>s</sup> 0 <sup>s</sup> 12	18 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 2
May 1	0 <sup>s</sup> 76 <sup>s</sup> 0 <sup>s</sup> 02	31 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 9	18 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 00	1 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 1	35 <sup>s</sup> 82 <sup>s</sup> 0 <sup>s</sup> 06	17 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 3
11	0 <sup>s</sup> 78 <sup>s</sup> 0 <sup>s</sup> 05	30 <sup>s</sup> 0 <sup>s</sup> 2 <sup>s</sup> 2	18 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 04	1 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 4	35 <sup>s</sup> 76 <sup>s</sup> 0 <sup>s</sup> 00	16 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 4
21	0 <sup>s</sup> 83 <sup>s</sup> 0 <sup>s</sup> 12	27 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 3	18 <sup>s</sup> 20 <sup>s</sup> 0 <sup>s</sup> 10	2 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 5	35 <sup>s</sup> 76 <sup>s</sup> 0 <sup>s</sup> 07	14 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 3
31	0 <sup>s</sup> 95 <sup>s</sup> 0 <sup>s</sup> 15	25 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 3	* 18 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 14	2 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 6	35 <sup>s</sup> 83 <sup>s</sup> 0 <sup>s</sup> 14	13 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 3
June 10	1 <sup>s</sup> 10 <sup>s</sup> 0 <sup>s</sup> 19	23 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 3	18 <sup>s</sup> 44 <sup>s</sup> 0 <sup>s</sup> 18	3 <sup>s</sup> 3 <sup>s</sup> 0 <sup>s</sup> 7	35 <sup>s</sup> 97 <sup>s</sup> 0 <sup>s</sup> 19	12 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 1
20	1 <sup>s</sup> 29 <sup>s</sup> 0 <sup>s</sup> 22	20 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 3	18 <sup>s</sup> 62 <sup>s</sup> 0 <sup>s</sup> 21	4 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 9	36 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 23	10 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 0
30	1 <sup>s</sup> 51 <sup>s</sup> 0 <sup>s</sup> 25	18 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 3	18 <sup>s</sup> 83 <sup>s</sup> 0 <sup>s</sup> 25	4 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 9	36 <sup>s</sup> 39 <sup>s</sup> 0 <sup>s</sup> 29	9 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 7
July 10	1 <sup>s</sup> 76 <sup>s</sup> 0 <sup>s</sup> 27	16 <sup>s</sup> 3 <sup>s</sup> 2 <sup>s</sup> 1	19 <sup>s</sup> 08 <sup>s</sup> 0 <sup>s</sup> 26	5 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 0	36 <sup>s</sup> 68 <sup>s</sup> 0 <sup>s</sup> 32	9 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 6
20	2 <sup>s</sup> 03 <sup>s</sup> 0 <sup>s</sup> 28	14 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 8	19 <sup>s</sup> 34 <sup>s</sup> 0 <sup>s</sup> 29	6 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 1	37 <sup>s</sup> 00 <sup>s</sup> 0 <sup>s</sup> 35	8 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 4
30	2 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 29	12 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 7	19 <sup>s</sup> 63 <sup>s</sup> 0 <sup>s</sup> 29	7 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 0	37 <sup>s</sup> 35 <sup>s</sup> 0 <sup>s</sup> 38	8 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 2
Aug. 9	2 <sup>s</sup> 60 <sup>s</sup> 0 <sup>s</sup> 29	10 <sup>s</sup> 7 <sup>s</sup> 1 <sup>s</sup> 3	19 <sup>s</sup> 92 <sup>s</sup> 0 <sup>s</sup> 30	8 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 0	37 <sup>s</sup> 73 <sup>s</sup> 0 <sup>s</sup> 39	8 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 1
19	2 <sup>s</sup> 89 <sup>s</sup> 0 <sup>s</sup> 29	9 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 9	20 <sup>s</sup> 22 <sup>s</sup> 0 <sup>s</sup> 31	9 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 9	38 <sup>s</sup> 12 <sup>s</sup> 0 <sup>s</sup> 40	8 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 2
29	3 <sup>s</sup> 18 <sup>s</sup> 0 <sup>s</sup> 28	8 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 6	20 <sup>s</sup> 53 <sup>s</sup> 0 <sup>s</sup> 29	10 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 9	38 <sup>s</sup> 52 <sup>s</sup> 0 <sup>s</sup> 40	8 <sup>s</sup> 3 <sup>s</sup> 0 <sup>s</sup> 4
Sept. 8	3 <sup>s</sup> 46 <sup>s</sup> 0 <sup>s</sup> 27	7 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 1	20 <sup>s</sup> 82 <sup>s</sup> 0 <sup>s</sup> 29	11 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 7	38 <sup>s</sup> 92 <sup>s</sup> 0 <sup>s</sup> 40	8 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 5
18	3 <sup>s</sup> 73 <sup>s</sup> 0 <sup>s</sup> 25	7 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 2	21 <sup>s</sup> 11 <sup>s</sup> 0 <sup>s</sup> 28	12 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 5	39 <sup>s</sup> 32 <sup>s</sup> 0 <sup>s</sup> 40	9 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 8
28	3 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 22	8 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 6	21 <sup>s</sup> 39 <sup>s</sup> 0 <sup>s</sup> 26	12 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 4	39 <sup>s</sup> 72 <sup>s</sup> 0 <sup>s</sup> 38	10 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 8
Oct. 8	4 <sup>s</sup> 20 <sup>s</sup> 0 <sup>s</sup> 21	8 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 0	21 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 25	13 <sup>s</sup> 3 <sup>s</sup> 0 <sup>s</sup> 3	40 <sup>s</sup> 10 <sup>s</sup> 0 <sup>s</sup> 37	10 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 1
18	4 <sup>s</sup> 41 <sup>s</sup> 0 <sup>s</sup> 17	9 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 3	21 <sup>s</sup> 90 <sup>s</sup> 0 <sup>s</sup> 22	13 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 1	40 <sup>s</sup> 47 <sup>s</sup> 0 <sup>s</sup> 34	11 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 1
28	4 <sup>s</sup> 58 <sup>s</sup> 0 <sup>s</sup> 15	10 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 5	22 <sup>s</sup> 12 <sup>s</sup> 0 <sup>s</sup> 19	13 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 1	40 <sup>s</sup> 81 <sup>s</sup> 0 <sup>s</sup> 31	13 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 3
Nov. 7	4 <sup>s</sup> 73 <sup>s</sup> 0 <sup>s</sup> 11	12 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 7	22 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 18	13 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 1	41 <sup>s</sup> 12 <sup>s</sup> 0 <sup>s</sup> 27	14 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 4
17	4 <sup>s</sup> 84 <sup>s</sup> 0 <sup>s</sup> 08	14 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 8	22 <sup>s</sup> 49 <sup>s</sup> 0 <sup>s</sup> 13	13 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 1	41 <sup>s</sup> 39 <sup>s</sup> 0 <sup>s</sup> 24	15 <sup>s</sup> 7 <sup>s</sup> 1 <sup>s</sup> 4
27	4 <sup>s</sup> 92 <sup>s</sup> 0 <sup>s</sup> 05	15 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 8	22 <sup>s</sup> 62 <sup>s</sup> 0 <sup>s</sup> 11	13 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 2	41 <sup>s</sup> 63 <sup>s</sup> 0 <sup>s</sup> 18	17 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 5
Dec. 7	4 <sup>s</sup> 97 <sup>s</sup> 0 <sup>s</sup> 01	17 <sup>s</sup> 7 <sup>s</sup> 1 <sup>s</sup> 7	22 <sup>s</sup> 73 <sup>s</sup> 0 <sup>s</sup> 06	13 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 1	41 <sup>s</sup> 81 <sup>s</sup> 0 <sup>s</sup> 13	18 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 6
17	4 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 03	19 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 6	22 <sup>s</sup> 79 <sup>s</sup> 0 <sup>s</sup> 02	13 <sup>s</sup> 3 <sup>s</sup> 0 <sup>s</sup> 3	41 <sup>s</sup> 94 <sup>s</sup> 0 <sup>s</sup> 07	20 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 5
27	4 <sup>s</sup> 95 <sup>s</sup> 0 <sup>s</sup> 07	21 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 5	22 <sup>s</sup> 81 <sup>s</sup> 0 <sup>s</sup> 01	13 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 2	42 <sup>s</sup> 01 <sup>s</sup> 0 <sup>s</sup> 01	21 <sup>s</sup> 7 <sup>s</sup> 1 <sup>s</sup> 4
37	4 <sup>s</sup> 88 <sup>s</sup> 0 <sup>s</sup> 07	22 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 4	22 <sup>s</sup> 80 <sup>s</sup> 0 <sup>s</sup> 01	12 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 2	42 <sup>s</sup> 02 <sup>s</sup> 0 <sup>s</sup> 01	23 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 4

APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\beta$ ORIONIS. (Rigel)				$\beta$ TAURI.				$\delta$ ORIONIS.			
	R. A.		Dec. South.		R. A.		Dec. North.		R. A.		Dec. South.	
	<sup>h</sup> 5	<sup>m</sup> 7	<sup>°</sup> 8	<sup>'</sup> 22	<sup>h</sup> 5	<sup>m</sup> 16	<sup>°</sup> 28	<sup>'</sup> 28	<sup>h</sup> 5	<sup>m</sup> 24	<sup>°</sup> 0	<sup>'</sup> 24
Jan. 1	20 <sup>s</sup> 51	0 <sup>s</sup> 02	57 <sup>s</sup> 1	1 <sup>s</sup> 5	49 <sup>s</sup> 56	0 <sup>s</sup> 01	23 <sup>s</sup> 9	0 <sup>s</sup> 5	21 <sup>s</sup> 44	0 <sup>s</sup> 00	63 <sup>s</sup> 4	1 <sup>s</sup> 2
11	20 <sup>s</sup> 49	0 <sup>s</sup> 06	58 <sup>s</sup> 6	1 <sup>s</sup> 3	49 <sup>s</sup> 55	0 <sup>s</sup> 03	24 <sup>s</sup> 4	0 <sup>s</sup> 4	21 <sup>s</sup> 44	0 <sup>s</sup> 04	64 <sup>s</sup> 6	1 <sup>s</sup> 0
21	20 <sup>s</sup> 43	0 <sup>s</sup> 10	59 <sup>s</sup> 9	1 <sup>s</sup> 1	49 <sup>s</sup> 50	0 <sup>s</sup> 09	24 <sup>s</sup> 8	0 <sup>s</sup> 3	21 <sup>s</sup> 40	0 <sup>s</sup> 09	65 <sup>s</sup> 6	0 <sup>s</sup> 8
31	20 <sup>s</sup> 33	0 <sup>s</sup> 14	61 <sup>s</sup> 0	0 <sup>s</sup> 8	49 <sup>s</sup> 41	0 <sup>s</sup> 14	25 <sup>s</sup> 1	0 <sup>s</sup> 3	21 <sup>s</sup> 31	0 <sup>s</sup> 12	66 <sup>s</sup> 4	0 <sup>s</sup> 7
Feb. 10	20 <sup>s</sup> 19	0 <sup>s</sup> 16	61 <sup>s</sup> 8	0 <sup>s</sup> 6	49 <sup>s</sup> 27	0 <sup>s</sup> 17	25 <sup>s</sup> 4	0 <sup>s</sup> 2	21 <sup>s</sup> 19	0 <sup>s</sup> 15	67 <sup>s</sup> 1	0 <sup>s</sup> 5
20	20 <sup>s</sup> 03	0 <sup>s</sup> 18	62 <sup>s</sup> 4	0 <sup>s</sup> 4	49 <sup>s</sup> 10	0 <sup>s</sup> 19	25 <sup>s</sup> 6	0 <sup>s</sup> 1	21 <sup>s</sup> 04	0 <sup>s</sup> 17	67 <sup>s</sup> 6	0 <sup>s</sup> 3
Mar. 2	19 <sup>s</sup> 85	0 <sup>s</sup> 19	62 <sup>s</sup> 8	0 <sup>s</sup> 1	48 <sup>s</sup> 91	0 <sup>s</sup> 20	25 <sup>s</sup> 7	0 <sup>s</sup> 1	20 <sup>s</sup> 87	0 <sup>s</sup> 18	67 <sup>s</sup> 9	0 <sup>s</sup> 2
12	19 <sup>s</sup> 66	0 <sup>s</sup> 19	62 <sup>s</sup> 9	0 <sup>s</sup> 2	48 <sup>s</sup> 71	0 <sup>s</sup> 21	25 <sup>s</sup> 6	0 <sup>s</sup> 1	20 <sup>s</sup> 69	0 <sup>s</sup> 19	68 <sup>s</sup> 1	0 <sup>s</sup> 1
22	19 <sup>s</sup> 47	0 <sup>s</sup> 17	62 <sup>s</sup> 7	0 <sup>s</sup> 4	48 <sup>s</sup> 50	0 <sup>s</sup> 19	25 <sup>s</sup> 5	0 <sup>s</sup> 3	20 <sup>s</sup> 50	0 <sup>s</sup> 17	68 <sup>s</sup> 0	0 <sup>s</sup> 2
Apr. 1	19 <sup>s</sup> 30	0 <sup>s</sup> 15	62 <sup>s</sup> 3	0 <sup>s</sup> 7	48 <sup>s</sup> 31	0 <sup>s</sup> 17	25 <sup>s</sup> 2	0 <sup>s</sup> 4	20 <sup>s</sup> 33	0 <sup>s</sup> 16	67 <sup>s</sup> 8	0 <sup>s</sup> 4
11	19 <sup>s</sup> 15	0 <sup>s</sup> 13	61 <sup>s</sup> 6	0 <sup>s</sup> 9	48 <sup>s</sup> 14	0 <sup>s</sup> 13	24 <sup>s</sup> 8	0 <sup>s</sup> 4	20 <sup>s</sup> 17	0 <sup>s</sup> 13	67 <sup>s</sup> 4	0 <sup>s</sup> 6
21	19 <sup>s</sup> 02	0 <sup>s</sup> 09	60 <sup>s</sup> 7	1 <sup>s</sup> 1	48 <sup>s</sup> 01	0 <sup>s</sup> 10	24 <sup>s</sup> 4	0 <sup>s</sup> 4	20 <sup>s</sup> 04	0 <sup>s</sup> 09	66 <sup>s</sup> 8	0 <sup>s</sup> 8
May 1	18 <sup>s</sup> 93	0 <sup>s</sup> 05	59 <sup>s</sup> 6	1 <sup>s</sup> 4	47 <sup>s</sup> 91	0 <sup>s</sup> 05	24 <sup>s</sup> 0	0 <sup>s</sup> 5	19 <sup>s</sup> 95	0 <sup>s</sup> 06	66 <sup>s</sup> 0	0 <sup>s</sup> 9
11	18 <sup>s</sup> 88	0 <sup>s</sup> 01	58 <sup>s</sup> 2	1 <sup>s</sup> 5	47 <sup>s</sup> 86	0 <sup>s</sup> 00	23 <sup>s</sup> 5	0 <sup>s</sup> 4	19 <sup>s</sup> 89	0 <sup>s</sup> 02	65 <sup>s</sup> 1	1 <sup>s</sup> 1
21	18 <sup>s</sup> 87	0 <sup>s</sup> 04	56 <sup>s</sup> 7	1 <sup>s</sup> 7	47 <sup>s</sup> 86	0 <sup>s</sup> 05	23 <sup>s</sup> 1	0 <sup>s</sup> 3	19 <sup>s</sup> 87	0 <sup>s</sup> 03	64 <sup>s</sup> 0	1 <sup>s</sup> 3
31	18 <sup>s</sup> 91	0 <sup>s</sup> 08	55 <sup>s</sup> 0	2 <sup>s</sup> 1	47 <sup>s</sup> 91	0 <sup>s</sup> 10	22 <sup>s</sup> 8	0 <sup>s</sup> 3	19 <sup>s</sup> 90	0 <sup>s</sup> 07	62 <sup>s</sup> 7	1 <sup>s</sup> 4
June 10	18 <sup>s</sup> 99	0 <sup>s</sup> 13	52 <sup>s</sup> 9	1 <sup>s</sup> 9	48 <sup>s</sup> 01	0 <sup>s</sup> 15	22 <sup>s</sup> 5	0 <sup>s</sup> 2	19 <sup>s</sup> 97	0 <sup>s</sup> 12	61 <sup>s</sup> 3	1 <sup>s</sup> 6
20	19 <sup>s</sup> 12	0 <sup>s</sup> 16	51 <sup>s</sup> 0	2 <sup>s</sup> 0	48 <sup>s</sup> 16	0 <sup>s</sup> 19	22 <sup>s</sup> 3	0 <sup>s</sup> 0	20 <sup>s</sup> 09	0 <sup>s</sup> 15	59 <sup>s</sup> 7	1 <sup>s</sup> 6
30	19 <sup>s</sup> 28	0 <sup>s</sup> 19	49 <sup>s</sup> 0	2 <sup>s</sup> 0	48 <sup>s</sup> 35	0 <sup>s</sup> 22	22 <sup>s</sup> 3	0 <sup>s</sup> 1	20 <sup>s</sup> 24	0 <sup>s</sup> 19	58 <sup>s</sup> 1	1 <sup>s</sup> 5
July 10	19 <sup>s</sup> 47	0 <sup>s</sup> 22	47 <sup>s</sup> 0	1 <sup>s</sup> 9	48 <sup>s</sup> 57	0 <sup>s</sup> 26	22 <sup>s</sup> 4	0 <sup>s</sup> 1	20 <sup>s</sup> 43	0 <sup>s</sup> 21	56 <sup>s</sup> 6	1 <sup>s</sup> 6
20	19 <sup>s</sup> 69	0 <sup>s</sup> 24	45 <sup>s</sup> 1	1 <sup>s</sup> 8	48 <sup>s</sup> 83	0 <sup>s</sup> 28	22 <sup>s</sup> 5	0 <sup>s</sup> 3	20 <sup>s</sup> 64	0 <sup>s</sup> 23	55 <sup>s</sup> 0	1 <sup>s</sup> 4
30	19 <sup>s</sup> 93	0 <sup>s</sup> 26	43 <sup>s</sup> 3	1 <sup>s</sup> 6	49 <sup>s</sup> 11	0 <sup>s</sup> 30	22 <sup>s</sup> 8	0 <sup>s</sup> 3	20 <sup>s</sup> 87	0 <sup>s</sup> 26	53 <sup>s</sup> 6	1 <sup>s</sup> 4
Aug. 9	20 <sup>s</sup> 19	0 <sup>s</sup> 28	41 <sup>s</sup> 7	1 <sup>s</sup> 3	49 <sup>s</sup> 41	0 <sup>s</sup> 31	23 <sup>s</sup> 1	0 <sup>s</sup> 4	21 <sup>s</sup> 13	0 <sup>s</sup> 26	52 <sup>s</sup> 2	1 <sup>s</sup> 1
19	20 <sup>s</sup> 47	0 <sup>s</sup> 28	40 <sup>s</sup> 4	1 <sup>s</sup> 1	49 <sup>s</sup> 72	0 <sup>s</sup> 33	23 <sup>s</sup> 5	0 <sup>s</sup> 4	21 <sup>s</sup> 39	0 <sup>s</sup> 28	51 <sup>s</sup> 1	1 <sup>s</sup> 0
29	20 <sup>s</sup> 75	0 <sup>s</sup> 28	39 <sup>s</sup> 3	0 <sup>s</sup> 7	50 <sup>s</sup> 05	0 <sup>s</sup> 32	23 <sup>s</sup> 9	0 <sup>s</sup> 5	21 <sup>s</sup> 67	0 <sup>s</sup> 28	50 <sup>s</sup> 1	0 <sup>s</sup> 6
Sept. 8	21 <sup>s</sup> 03	0 <sup>s</sup> 28	38 <sup>s</sup> 6	0 <sup>s</sup> 3	50 <sup>s</sup> 37	0 <sup>s</sup> 33	24 <sup>s</sup> 4	0 <sup>s</sup> 4	21 <sup>s</sup> 95	0 <sup>s</sup> 28	49 <sup>s</sup> 5	0 <sup>s</sup> 4
18	21 <sup>s</sup> 31	0 <sup>s</sup> 27	38 <sup>s</sup> 3	0 <sup>s</sup> 0	50 <sup>s</sup> 70	0 <sup>s</sup> 32	24 <sup>s</sup> 8	0 <sup>s</sup> 5	22 <sup>s</sup> 23	0 <sup>s</sup> 28	48 <sup>s</sup> 1	0 <sup>s</sup> 4
28	21 <sup>s</sup> 58	0 <sup>s</sup> 27	38 <sup>s</sup> 3	0 <sup>s</sup> 3	51 <sup>s</sup> 02	0 <sup>s</sup> 31	25 <sup>s</sup> 3	0 <sup>s</sup> 4	22 <sup>s</sup> 51	0 <sup>s</sup> 28		
Oct. 8	21 <sup>s</sup> 85	0 <sup>s</sup> 25	38 <sup>s</sup> 6	0 <sup>s</sup> 8	51 <sup>s</sup> 33	0 <sup>s</sup> 30	25 <sup>s</sup> 7	0 <sup>s</sup> 4				
18	22 <sup>s</sup> 10	0 <sup>s</sup> 24	39 <sup>s</sup> 4	1 <sup>s</sup> 0	51 <sup>s</sup> 63	0 <sup>s</sup> 29	26 <sup>s</sup> 1	0 <sup>s</sup> 4				
28	22 <sup>s</sup> 34	0 <sup>s</sup> 21	40 <sup>s</sup> 4	1 <sup>s</sup> 3	51 <sup>s</sup> 92	0 <sup>s</sup> 26	26 <sup>s</sup> 5	0 <sup>s</sup> 4				
Nov. 7	22 <sup>s</sup> 55	0 <sup>s</sup> 19	41 <sup>s</sup> 7	1 <sup>s</sup> 5	52 <sup>s</sup> 18	0 <sup>s</sup> 23	26 <sup>s</sup> 9	0 <sup>s</sup> 4				
17	22 <sup>s</sup> 74	0 <sup>s</sup> 16	43 <sup>s</sup> 2	1 <sup>s</sup> 6	52 <sup>s</sup> 41	0 <sup>s</sup> 21	27 <sup>s</sup> 3	0 <sup>s</sup> 4				
27	22 <sup>s</sup> 90	0 <sup>s</sup> 12	44 <sup>s</sup> 8	1 <sup>s</sup> 8	52 <sup>s</sup> 62	0 <sup>s</sup> 17	27 <sup>s</sup> 7	0 <sup>s</sup> 4				
Dec. 7	23 <sup>s</sup> 02	0 <sup>s</sup> 08	46 <sup>s</sup> 6	1 <sup>s</sup> 7	52 <sup>s</sup> 79	0 <sup>s</sup> 12	28 <sup>s</sup> 1	0 <sup>s</sup> 5				
17	23 <sup>s</sup> 10	0 <sup>s</sup> 05	48 <sup>s</sup> 3	1 <sup>s</sup> 6	52 <sup>s</sup> 91	0 <sup>s</sup> 08	28 <sup>s</sup> 6	0 <sup>s</sup> 5				
27	23 <sup>s</sup> 15	0 <sup>s</sup> 00	49 <sup>s</sup> 9	1 <sup>s</sup> 6	52 <sup>s</sup> 99	0 <sup>s</sup> 03	29 <sup>s</sup> 1	0 <sup>s</sup> 4				
37	23 <sup>s</sup> 15		51 <sup>s</sup> 5		53 <sup>s</sup> 02		29 <sup>s</sup> 5					



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ Leporis.		$\epsilon$ ORIONIS.		$\alpha$ Columbæ.	
	R. A.	Dec. South.	R. A.	Dec. South.	R. A.	Dec. S.
	<sup>h</sup> 5 <sup>m</sup> 26	<sup>o</sup> 17 <sup>'</sup> 55 <sup>"</sup>	<sup>h</sup> 5 <sup>m</sup> 28	<sup>o</sup> 1 <sup>'</sup> 18 <sup>"</sup>	<sup>h</sup> 5 <sup>m</sup> 34	<sup>o</sup> 34 <sup>"</sup>
Jan. 1	7 <sup>s</sup> 78 <sup>s</sup>	73 <sup>s</sup> 1 <sup>s</sup>	36 <sup>s</sup> 90 <sup>s</sup>	18 <sup>s</sup> 5 <sup>s</sup>	14 <sup>s</sup> 29 <sup>s</sup>	37 <sup>s</sup> 7 <sup>s</sup>
11	7 <sup>s</sup> 76 <sup>s</sup> 0 <sup>s</sup> 02	75 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 9	36 <sup>s</sup> 91 <sup>s</sup> 0 <sup>s</sup> 01	19 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 3	14 <sup>s</sup> 25 <sup>s</sup> 0 <sup>s</sup> 04	40 <sup>s</sup> 3 <sup>s</sup>
21	7 <sup>s</sup> 70 <sup>s</sup> 0 <sup>s</sup> 06	76 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 8	36 <sup>s</sup> 87 <sup>s</sup> 0 <sup>s</sup> 04	20 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 0	14 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 09	42 <sup>s</sup> 7 <sup>s</sup>
31	7 <sup>s</sup> 59 <sup>s</sup> 0 <sup>s</sup> 11	78 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 5	36 <sup>s</sup> 78 <sup>s</sup> 0 <sup>s</sup> 09	21 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 9	14 <sup>s</sup> 03 <sup>s</sup> 0 <sup>s</sup> 13	44 <sup>s</sup> 7 <sup>s</sup>
	0 <sup>s</sup> 14	1 <sup>s</sup> 2	0 <sup>s</sup> 12	0 <sup>s</sup> 7	0 <sup>s</sup> 18	
Feb. 10	7 <sup>s</sup> 45 <sup>s</sup> 0 <sup>s</sup> 16	79 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 9	36 <sup>s</sup> 66 <sup>s</sup> 0 <sup>s</sup> 15	22 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 6	13 <sup>s</sup> 85 <sup>s</sup> 0 <sup>s</sup> 20	46 <sup>s</sup> 3 <sup>s</sup>
20	7 <sup>s</sup> 29 <sup>s</sup> 0 <sup>s</sup> 19	80 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 5	36 <sup>s</sup> 51 <sup>s</sup> 0 <sup>s</sup> 17	23 <sup>s</sup> 0 <sup>s</sup> 3	13 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 23	47 <sup>s</sup> 3 <sup>s</sup>
Mar. 2	7 <sup>s</sup> 10 <sup>s</sup> 0 <sup>s</sup> 20	80 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 2	36 <sup>s</sup> 34 <sup>s</sup> 0 <sup>s</sup> 18	23 <sup>s</sup> 3 <sup>s</sup> 0 <sup>s</sup> 1	13 <sup>s</sup> 42 <sup>s</sup> 0 <sup>s</sup> 25	48 <sup>s</sup> 3 <sup>s</sup>
12	6 <sup>s</sup> 90 <sup>s</sup> 0 <sup>s</sup> 21	81 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 2	36 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 18	23 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 0	13 <sup>s</sup> 17 <sup>s</sup> 0 <sup>s</sup> 25	48 <sup>s</sup> 3 <sup>s</sup>
	0 <sup>s</sup> 21	0 <sup>s</sup> 2	0 <sup>s</sup> 18	0 <sup>s</sup> 0	0 <sup>s</sup> 25	
22	6 <sup>s</sup> 69 <sup>s</sup> 0 <sup>s</sup> 19	80 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 5	35 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 18	23 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 2	12 <sup>s</sup> 92 <sup>s</sup> 0 <sup>s</sup> 24	48 <sup>s</sup> 3 <sup>s</sup>
Apr. 1	6 <sup>s</sup> 50 <sup>s</sup> 0 <sup>s</sup> 17	80 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 8	35 <sup>s</sup> 80 <sup>s</sup> 0 <sup>s</sup> 16	23 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 4	12 <sup>s</sup> 68 <sup>s</sup> 0 <sup>s</sup> 22	47 <sup>s</sup> 3 <sup>s</sup>
11	6 <sup>s</sup> 33 <sup>s</sup> 0 <sup>s</sup> 15	79 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 1	35 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 13	22 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 7	12 <sup>s</sup> 46 <sup>s</sup> 0 <sup>s</sup> 19	46 <sup>s</sup> 3 <sup>s</sup>
21	6 <sup>s</sup> 18 <sup>s</sup> 0 <sup>s</sup> 12	78 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 4	35 <sup>s</sup> 51 <sup>s</sup> 0 <sup>s</sup> 10	22 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 8	12 <sup>s</sup> 27 <sup>s</sup> 0 <sup>s</sup> 16	45 <sup>s</sup> 3 <sup>s</sup>
	0 <sup>s</sup> 08	1 <sup>s</sup> 7	0 <sup>s</sup> 06	1 <sup>s</sup> 0	0 <sup>s</sup> 11	43 <sup>s</sup> 3 <sup>s</sup>
May 1	6 <sup>s</sup> 06 <sup>s</sup> 0 <sup>s</sup> 03	77 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 9	35 <sup>s</sup> 35 <sup>s</sup> 0 <sup>s</sup> 02	20 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 1	12 <sup>s</sup> 00 <sup>s</sup> 0 <sup>s</sup> 07	41 <sup>s</sup> 3 <sup>s</sup>
11	5 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 01	73 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 1	35 <sup>s</sup> 33 <sup>s</sup> 0 <sup>s</sup> 02	19 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 3	11 <sup>s</sup> 93 <sup>s</sup> 0 <sup>s</sup> 03	38 <sup>s</sup> 3 <sup>s</sup>
21	5 <sup>s</sup> 96 <sup>s</sup> 0 <sup>s</sup> 05	71 <sup>s</sup> 4 <sup>s</sup> 2 <sup>s</sup> 2	35 <sup>s</sup> 35 <sup>s</sup> 0 <sup>s</sup> 07	17 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 4	11 <sup>s</sup> 90 <sup>s</sup> 0 <sup>s</sup> 02	36 <sup>s</sup> 3 <sup>s</sup>
	0 <sup>s</sup> 11	2 <sup>s</sup> 6	0 <sup>s</sup> 11	1 <sup>s</sup> 7	0 <sup>s</sup> 09	33 <sup>s</sup> 3 <sup>s</sup>
June 10	6 <sup>s</sup> 12 <sup>s</sup> 0 <sup>s</sup> 14	66 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 4	35 <sup>s</sup> 53 <sup>s</sup> 0 <sup>s</sup> 15	14 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 6	12 <sup>s</sup> 01 <sup>s</sup> 0 <sup>s</sup> 12	30 <sup>s</sup> 3 <sup>s</sup>
20	6 <sup>s</sup> 26 <sup>s</sup> 0 <sup>s</sup> 17	64 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 4	35 <sup>s</sup> 68 <sup>s</sup> 0 <sup>s</sup> 18	13 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 6	12 <sup>s</sup> 13 <sup>s</sup> 0 <sup>s</sup> 16	27 <sup>s</sup> 3 <sup>s</sup>
July 10	6 <sup>s</sup> 43 <sup>s</sup> 0 <sup>s</sup> 20	61 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 2	35 <sup>s</sup> 86 <sup>s</sup> 0 <sup>s</sup> 21	11 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 5	12 <sup>s</sup> 29 <sup>s</sup> 0 <sup>s</sup> 20	24 <sup>s</sup> 3 <sup>s</sup>
	0 <sup>s</sup> 24	2 <sup>s</sup> 1	0 <sup>s</sup> 23	1 <sup>s</sup> 5	0 <sup>s</sup> 23	21 <sup>s</sup> 3 <sup>s</sup>
20	6 <sup>s</sup> 63 <sup>s</sup> 0 <sup>s</sup> 25	57 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 9	36 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 25	8 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 4	12 <sup>s</sup> 72 <sup>s</sup> 0 <sup>s</sup> 27	18 <sup>s</sup> 3 <sup>s</sup>
30	7 <sup>s</sup> 12 <sup>s</sup> 0 <sup>s</sup> 27	55 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 5	36 <sup>s</sup> 55 <sup>s</sup> 0 <sup>s</sup> 27	7 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 2	12 <sup>s</sup> 99 <sup>s</sup> 0 <sup>s</sup> 28	16 <sup>s</sup> 3 <sup>s</sup>
Aug. 9	7 <sup>s</sup> 39 <sup>s</sup> 0 <sup>s</sup> 27	54 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 2	36 <sup>s</sup> 82 <sup>s</sup> 0 <sup>s</sup> 27	6 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 9	13 <sup>s</sup> 27 <sup>s</sup> 0 <sup>s</sup> 30	14 <sup>s</sup> 3 <sup>s</sup>
19	7 <sup>s</sup> 66 <sup>s</sup> 0 <sup>s</sup> 29	52 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 8	37 <sup>s</sup> 09 <sup>s</sup> 0 <sup>s</sup> 28	5 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 7	13 <sup>s</sup> 57 <sup>s</sup> 0 <sup>s</sup> 31	13 <sup>s</sup> 3 <sup>s</sup>
29	7 <sup>s</sup> 95 <sup>s</sup> 0 <sup>s</sup> 29	51 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 4	37 <sup>s</sup> 37 <sup>s</sup> 0 <sup>s</sup> 28	4 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 3	13 <sup>s</sup> 88 <sup>s</sup> 0 <sup>s</sup> 32	12 <sup>s</sup> 3 <sup>s</sup>
Sept. 8	8 <sup>s</sup> 24 <sup>s</sup> 0 <sup>s</sup> 28	51 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 1	37 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 28	4 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 1	14 <sup>s</sup> 20 <sup>s</sup> 0 <sup>s</sup> 31	12 <sup>s</sup> 3 <sup>s</sup>
18	8 <sup>s</sup> 52 <sup>s</sup> 0 <sup>s</sup> 28	52 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 0	38 <sup>s</sup> 21 <sup>s</sup> 0 <sup>s</sup> 26	4 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 5	14 <sup>s</sup> 82 <sup>s</sup> 0 <sup>s</sup> 29	14 <sup>s</sup> 3 <sup>s</sup>
28	9 <sup>s</sup> 06 <sup>s</sup> 0 <sup>s</sup> 25	54 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 3	38 <sup>s</sup> 47 <sup>s</sup> 0 <sup>s</sup> 25	5 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 8	15 <sup>s</sup> 11 <sup>s</sup> 0 <sup>s</sup> 27	15 <sup>s</sup> 3 <sup>s</sup>
Oct. 8	9 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 23	56 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 7	38 <sup>s</sup> 72 <sup>s</sup> 0 <sup>s</sup> 23	6 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 1	15 <sup>s</sup> 38 <sup>s</sup> 0 <sup>s</sup> 25	18 <sup>s</sup> 3 <sup>s</sup>
Nov. 7	9 <sup>s</sup> 54 <sup>s</sup> 0 <sup>s</sup> 20	58 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 2	39 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 18	7 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 3	15 <sup>s</sup> 63 <sup>s</sup> 0 <sup>s</sup> 22	20 <sup>s</sup> 3 <sup>s</sup>
17	9 <sup>s</sup> 74 <sup>s</sup> 0 <sup>s</sup> 17	60 <sup>s</sup> 4 <sup>s</sup> 2 <sup>s</sup> 2	39 <sup>s</sup> 34 <sup>s</sup> 0 <sup>s</sup> 15	9 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 4	16 <sup>s</sup> 03 <sup>s</sup> 0 <sup>s</sup> 14	23 <sup>s</sup> 3 <sup>s</sup>
27	10 <sup>s</sup> 05 <sup>s</sup> 0 <sup>s</sup> 10	62 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 3	39 <sup>s</sup> 49 <sup>s</sup> 0 <sup>s</sup> 11	10 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 4	16 <sup>s</sup> 17 <sup>s</sup> 0 <sup>s</sup> 09	26 <sup>s</sup> 3 <sup>s</sup>
Dec. 7	10 <sup>s</sup> 15 <sup>s</sup> 0 <sup>s</sup> 05	67 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 1	39 <sup>s</sup> 60 <sup>s</sup> 0 <sup>s</sup> 07	11 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 3	16 <sup>s</sup> 26 <sup>s</sup> 0 <sup>s</sup> 04	29 <sup>s</sup> 3 <sup>s</sup>
17	10 <sup>s</sup> 20 <sup>s</sup> 0 <sup>s</sup> 01	69 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 1	39 <sup>s</sup> 67 <sup>s</sup> 0 <sup>s</sup> 03	13 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 3	16 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 01	32 <sup>s</sup> 3 <sup>s</sup>
27	10 <sup>s</sup> 21 <sup>s</sup> 0 <sup>s</sup> 01		39 <sup>s</sup> 70 <sup>s</sup> 0 <sup>s</sup> 03	14 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 3	16 <sup>s</sup> 29 <sup>s</sup> 0 <sup>s</sup> 01	34 <sup>s</sup> 3 <sup>s</sup>

APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ ORIONIS.		$\mu$ Geminorum.		$\alpha$ Argus. (Canopus)	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. South.
	<sup>h</sup> 5 <sup>m</sup> 47	<sup>°</sup> 7 <sup>'</sup> 22	<sup>h</sup> 6 <sup>m</sup> 13	<sup>°</sup> 22 <sup>'</sup> 34	<sup>h</sup> 6 <sup>m</sup> 20	<sup>°</sup> 52 <sup>'</sup> 36
Jan. 1	3 <sup>s</sup> 84 <sup>s</sup>	17 <sup>s</sup> 5 <sup>s</sup>	53 <sup>s</sup> 87 <sup>s</sup>	58 <sup>s</sup> 1 <sup>s</sup>	39 <sup>s</sup> 52 <sup>s</sup>	65 <sup>s</sup> 9 <sup>s</sup>
11	3 <sup>m</sup> 86 <sup>m</sup> 0 <sup>s</sup> 02	16 <sup>m</sup> 7 <sup>m</sup> 0 <sup>s</sup> 8	53 <sup>m</sup> 93 <sup>m</sup> 0 <sup>s</sup> 06	58 <sup>m</sup> 2 <sup>m</sup> 0 <sup>s</sup> 1	39 <sup>m</sup> 48 <sup>m</sup> 0 <sup>s</sup> 04	69 <sup>m</sup> 2 <sup>m</sup> 3 <sup>s</sup> 3
21	3 <sup>s</sup> 84 <sup>s</sup> 0 <sup>m</sup> 02	16 <sup>s</sup> 1 <sup>s</sup> 0 <sup>m</sup> 6	53 <sup>s</sup> 93 <sup>s</sup> 0 <sup>m</sup> 00	58 <sup>s</sup> 4 <sup>s</sup> 0 <sup>m</sup> 2	39 <sup>s</sup> 37 <sup>s</sup> 0 <sup>m</sup> 11	72 <sup>s</sup> 3 <sup>s</sup> 3 <sup>m</sup> 1
31	3 <sup>m</sup> 77 <sup>m</sup> 0 <sup>s</sup> 07	15 <sup>m</sup> 5 <sup>m</sup> 0 <sup>s</sup> 6	53 <sup>m</sup> 89 <sup>m</sup> 0 <sup>s</sup> 04	58 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 2	39 <sup>m</sup> 20 <sup>m</sup> 0 <sup>s</sup> 17	75 <sup>m</sup> 1 <sup>m</sup> 2 <sup>s</sup> 8
	0 <sup>s</sup> 10	0 <sup>s</sup> 4	0 <sup>s</sup> 09	0 <sup>s</sup> 2	0 <sup>s</sup> 24	2 <sup>s</sup> 4
Feb. 10	3 <sup>s</sup> 67 <sup>s</sup>	15 <sup>s</sup> 1 <sup>s</sup>	53 <sup>s</sup> 80 <sup>s</sup>	58 <sup>s</sup> 8 <sup>s</sup>	38 <sup>s</sup> 96 <sup>s</sup>	77 <sup>s</sup> 5 <sup>s</sup>
20	3 <sup>m</sup> 53 <sup>m</sup> 0 <sup>s</sup> 14	14 <sup>m</sup> 8 <sup>m</sup> 0 <sup>s</sup> 3	53 <sup>m</sup> 67 <sup>m</sup> 0 <sup>s</sup> 13	59 <sup>m</sup> 0 <sup>m</sup> 0 <sup>s</sup> 2	38 <sup>m</sup> 68 <sup>m</sup> 0 <sup>s</sup> 28	79 <sup>m</sup> 4 <sup>m</sup> 1 <sup>s</sup> 9
Mar. 2	3 <sup>s</sup> 37 <sup>s</sup> 0 <sup>m</sup> 16	14 <sup>s</sup> 6 <sup>s</sup> 0 <sup>m</sup> 2	53 <sup>s</sup> 51 <sup>s</sup> 0 <sup>m</sup> 16	59 <sup>s</sup> 2 <sup>s</sup> 0 <sup>m</sup> 2	38 <sup>s</sup> 36 <sup>s</sup> 0 <sup>m</sup> 32	80 <sup>s</sup> 8 <sup>s</sup> 1 <sup>m</sup> 4
12	3 <sup>m</sup> 19 <sup>m</sup> 0 <sup>s</sup> 18	14 <sup>m</sup> 5 <sup>m</sup> 0 <sup>s</sup> 1	53 <sup>m</sup> 32 <sup>m</sup> 0 <sup>s</sup> 19	59 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 2	38 <sup>m</sup> 01 <sup>m</sup> 0 <sup>s</sup> 35	81 <sup>m</sup> 7 <sup>m</sup> 0 <sup>s</sup> 9
	0 <sup>s</sup> 18	0 <sup>s</sup> 0	0 <sup>s</sup> 19	0 <sup>s</sup> 2	0 <sup>s</sup> 36	0 <sup>s</sup> 4
22	3 <sup>s</sup> 01 <sup>s</sup>	14 <sup>s</sup> 5 <sup>s</sup>	53 <sup>s</sup> 13 <sup>s</sup>	59 <sup>s</sup> 6 <sup>s</sup>	37 <sup>s</sup> 65 <sup>s</sup>	82 <sup>s</sup> 1 <sup>s</sup>
Apr. 1	2 <sup>m</sup> 83 <sup>m</sup> 0 <sup>s</sup> 18	14 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 1	52 <sup>m</sup> 94 <sup>m</sup> 0 <sup>s</sup> 19	59 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 0	37 <sup>m</sup> 29 <sup>m</sup> 0 <sup>s</sup> 36	82 <sup>m</sup> 0 <sup>m</sup> 0 <sup>s</sup> 1
11	2 <sup>s</sup> 66 <sup>s</sup> 0 <sup>m</sup> 17	14 <sup>s</sup> 8 <sup>s</sup> 0 <sup>m</sup> 2	52 <sup>s</sup> 76 <sup>s</sup> 0 <sup>m</sup> 18	59 <sup>s</sup> 6 <sup>s</sup> 0 <sup>m</sup> 0	36 <sup>s</sup> 94 <sup>s</sup> 0 <sup>m</sup> 35	81 <sup>s</sup> 3 <sup>s</sup> 0 <sup>m</sup> 7
21	2 <sup>m</sup> 52 <sup>m</sup> 0 <sup>s</sup> 14	15 <sup>m</sup> 2 <sup>m</sup> 0 <sup>s</sup> 4	52 <sup>m</sup> 60 <sup>m</sup> 0 <sup>s</sup> 16	59 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 0	36 <sup>m</sup> 61 <sup>m</sup> 0 <sup>s</sup> 33	80 <sup>m</sup> 2 <sup>m</sup> 1 <sup>s</sup> 1
	0 <sup>s</sup> 10	0 <sup>s</sup> 4	0 <sup>s</sup> 13	0 <sup>s</sup> 0	0 <sup>s</sup> 29	1 <sup>s</sup> 6
May 1	2 <sup>s</sup> 42 <sup>s</sup>	15 <sup>s</sup> 6 <sup>s</sup>	52 <sup>s</sup> 47 <sup>s</sup>	59 <sup>s</sup> 6 <sup>s</sup>	36 <sup>s</sup> 32 <sup>s</sup>	78 <sup>s</sup> 6 <sup>s</sup>
11	2 <sup>m</sup> 35 <sup>m</sup> 0 <sup>s</sup> 07	16 <sup>m</sup> 2 <sup>m</sup> 0 <sup>s</sup> 6	52 <sup>m</sup> 38 <sup>m</sup> 0 <sup>s</sup> 09	59 <sup>m</sup> 5 <sup>m</sup> 0 <sup>s</sup> 1	36 <sup>m</sup> 07 <sup>m</sup> 0 <sup>s</sup> 25	76 <sup>m</sup> 6 <sup>m</sup> 2 <sup>s</sup> 0
21	2 <sup>s</sup> 32 <sup>s</sup> 0 <sup>m</sup> 03	16 <sup>s</sup> 9 <sup>s</sup> 0 <sup>m</sup> 7	52 <sup>s</sup> 33 <sup>s</sup> 0 <sup>m</sup> 05	59 <sup>s</sup> 4 <sup>s</sup> 0 <sup>m</sup> 1	35 <sup>s</sup> 87 <sup>s</sup> 0 <sup>m</sup> 20	74 <sup>s</sup> 2 <sup>s</sup> 2 <sup>m</sup> 4
31	2 <sup>m</sup> 33 <sup>m</sup> 0 <sup>s</sup> 01	17 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 7	52 <sup>m</sup> 33 <sup>m</sup> 0 <sup>s</sup> 00	59 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 0	35 <sup>m</sup> 73 <sup>m</sup> 0 <sup>s</sup> 14	71 <sup>m</sup> 4 <sup>m</sup> 2 <sup>s</sup> 8
	0 <sup>s</sup> 05	0 <sup>s</sup> 9	0 <sup>s</sup> 03	0 <sup>s</sup> 0	0 <sup>s</sup> 09	3 <sup>s</sup> 0
June 10	2 <sup>s</sup> 38 <sup>s</sup>	18 <sup>s</sup> 5 <sup>s</sup>	52 <sup>s</sup> 36 <sup>s</sup>	59 <sup>s</sup> 4 <sup>s</sup>	35 <sup>s</sup> 64 <sup>s</sup>	68 <sup>s</sup> 4 <sup>s</sup>
20	2 <sup>m</sup> 49 <sup>m</sup> 0 <sup>s</sup> 11	19 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 1	52 <sup>m</sup> 44 <sup>m</sup> 0 <sup>s</sup> 08	59 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 0	35 <sup>m</sup> 62 <sup>m</sup> 0 <sup>s</sup> 02	65 <sup>m</sup> 2 <sup>m</sup> 3 <sup>s</sup> 2
30	2 <sup>s</sup> 63 <sup>s</sup> 0 <sup>m</sup> 14	20 <sup>s</sup> 7 <sup>s</sup> 0 <sup>m</sup> 1	52 <sup>s</sup> 58 <sup>s</sup> 0 <sup>m</sup> 14	59 <sup>s</sup> 5 <sup>s</sup> 0 <sup>m</sup> 1	35 <sup>s</sup> 66 <sup>s</sup> 0 <sup>m</sup> 04	61 <sup>s</sup> 6 <sup>s</sup> 3 <sup>m</sup> 6
July 10	2 <sup>m</sup> 80 <sup>m</sup> 0 <sup>s</sup> 17	21 <sup>m</sup> 8 <sup>m</sup> 0 <sup>s</sup> 1	52 <sup>m</sup> 75 <sup>m</sup> 0 <sup>s</sup> 17	59 <sup>m</sup> 7 <sup>m</sup> 0 <sup>s</sup> 2	35 <sup>m</sup> 76 <sup>m</sup> 0 <sup>s</sup> 10	58 <sup>m</sup> 3 <sup>m</sup> 3 <sup>s</sup> 3
	0 <sup>s</sup> 20	1 <sup>s</sup> 1	0 <sup>s</sup> 19	0 <sup>s</sup> 1	0 <sup>s</sup> 16	3 <sup>s</sup> 2
20	3 <sup>s</sup> 00 <sup>s</sup>	22 <sup>s</sup> 9 <sup>s</sup>	52 <sup>s</sup> 94 <sup>s</sup>	59 <sup>s</sup> 8 <sup>s</sup>	35 <sup>s</sup> 92 <sup>s</sup>	55 <sup>s</sup> 1 <sup>s</sup>
30	3 <sup>m</sup> 22 <sup>m</sup> 0 <sup>s</sup> 22	23 <sup>m</sup> 9 <sup>m</sup> 0 <sup>s</sup> 1	53 <sup>m</sup> 17 <sup>m</sup> 0 <sup>s</sup> 23	60 <sup>m</sup> 0 <sup>m</sup> 0 <sup>s</sup> 2	36 <sup>m</sup> 13 <sup>m</sup> 0 <sup>s</sup> 21	52 <sup>m</sup> 0 <sup>m</sup> 3 <sup>s</sup> 1
Aug. 9	3 <sup>s</sup> 47 <sup>s</sup> 0 <sup>m</sup> 25	24 <sup>s</sup> 9 <sup>s</sup> 0 <sup>m</sup> 1	53 <sup>s</sup> 42 <sup>s</sup> 0 <sup>m</sup> 25	60 <sup>s</sup> 2 <sup>s</sup> 0 <sup>m</sup> 2	36 <sup>s</sup> 39 <sup>s</sup> 0 <sup>m</sup> 26	49 <sup>s</sup> 2 <sup>s</sup> 2 <sup>m</sup> 8
19	3 <sup>m</sup> 73 <sup>m</sup> 0 <sup>s</sup> 26	25 <sup>m</sup> 8 <sup>m</sup> 0 <sup>s</sup> 9	53 <sup>m</sup> 69 <sup>m</sup> 0 <sup>s</sup> 27	60 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 2	36 <sup>m</sup> 69 <sup>m</sup> 0 <sup>s</sup> 30	46 <sup>m</sup> 8 <sup>m</sup> 2 <sup>s</sup> 4
	0 <sup>s</sup> 28	0 <sup>s</sup> 7	0 <sup>s</sup> 28	0 <sup>s</sup> 1	0 <sup>s</sup> 34	2 <sup>s</sup> 0
29	4 <sup>s</sup> 01 <sup>s</sup>	26 <sup>s</sup> 5 <sup>s</sup>	53 <sup>s</sup> 97 <sup>s</sup>	60 <sup>s</sup> 5 <sup>s</sup>	37 <sup>s</sup> 03 <sup>s</sup>	44 <sup>s</sup> 8 <sup>s</sup>
Sept. 8	4 <sup>m</sup> 29 <sup>m</sup> 0 <sup>s</sup> 28	27 <sup>m</sup> 0 <sup>m</sup> 0 <sup>s</sup> 5	54 <sup>m</sup> 27 <sup>m</sup> 0 <sup>s</sup> 30	60 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 1	37 <sup>m</sup> 40 <sup>m</sup> 0 <sup>s</sup> 37	43 <sup>m</sup> 4 <sup>m</sup> 1 <sup>s</sup> 4
18	4 <sup>s</sup> 57 <sup>s</sup> 0 <sup>m</sup> 28	27 <sup>s</sup> 3 <sup>s</sup> 0 <sup>m</sup> 3	54 <sup>s</sup> 57 <sup>s</sup> 0 <sup>m</sup> 30	60 <sup>s</sup> 7 <sup>s</sup> 0 <sup>m</sup> 1	37 <sup>s</sup> 79 <sup>s</sup> 0 <sup>m</sup> 39	42 <sup>s</sup> 6 <sup>s</sup> 0 <sup>m</sup> 8
28	4 <sup>m</sup> 86 <sup>m</sup> 0 <sup>s</sup> 29	27 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 1	54 <sup>m</sup> 89 <sup>m</sup> 0 <sup>s</sup> 32	60 <sup>m</sup> 6 <sup>m</sup> 0 <sup>s</sup> 1	38 <sup>m</sup> 19 <sup>m</sup> 0 <sup>s</sup> 40	42 <sup>m</sup> 3 <sup>m</sup> 0 <sup>s</sup> 3
	0 <sup>s</sup> 28	0 <sup>s</sup> 1	0 <sup>s</sup> 31	0 <sup>s</sup> 1	0 <sup>s</sup> 41	0 <sup>s</sup> 5
Oct. 8	5 <sup>s</sup> 14 <sup>s</sup>	27 <sup>s</sup> 3 <sup>s</sup>	55 <sup>s</sup> 20 <sup>s</sup>	60 <sup>s</sup> 5 <sup>s</sup>	38 <sup>s</sup> 60 <sup>s</sup>	42 <sup>s</sup> 8 <sup>s</sup>
18	5 <sup>m</sup> 42 <sup>m</sup> 0 <sup>s</sup> 28	26 <sup>m</sup> 9 <sup>m</sup> 0 <sup>s</sup> 4	55 <sup>m</sup> 51 <sup>m</sup> 0 <sup>s</sup> 31	60 <sup>m</sup> 3 <sup>m</sup> 0 <sup>s</sup> 2	39 <sup>m</sup> 00 <sup>m</sup> 0 <sup>s</sup> 40	43 <sup>m</sup> 8 <sup>m</sup> 1 <sup>s</sup> 0
28	5 <sup>s</sup> 69 <sup>s</sup> 0 <sup>m</sup> 27	26 <sup>s</sup> 4 <sup>s</sup> 0 <sup>m</sup> 5	55 <sup>s</sup> 81 <sup>s</sup> 0 <sup>m</sup> 30	60 <sup>s</sup> 1 <sup>s</sup> 0 <sup>m</sup> 2	39 <sup>s</sup> 37 <sup>s</sup> 0 <sup>m</sup> 37	45 <sup>s</sup> 4 <sup>s</sup> 1 <sup>m</sup> 6
Nov. 7	5 <sup>m</sup> 94 <sup>m</sup> 0 <sup>s</sup> 25	25 <sup>m</sup> 7 <sup>m</sup> 0 <sup>s</sup> 7	56 <sup>m</sup> 10 <sup>m</sup> 0 <sup>s</sup> 29	59 <sup>m</sup> 9 <sup>m</sup> 0 <sup>s</sup> 2	39 <sup>m</sup> 72 <sup>m</sup> 0 <sup>s</sup> 22	6 <sup>m</sup> 2 <sup>s</sup> 2
	0 <sup>s</sup> 23	0 <sup>s</sup> 9	0 <sup>s</sup> 28	0 <sup>s</sup> 3	0 <sup>s</sup> 22	2 <sup>s</sup> 7
17	6 <sup>s</sup> 17 <sup>s</sup>	24 <sup>s</sup> 8 <sup>s</sup>	56 <sup>s</sup> 38 <sup>s</sup>	59 <sup>s</sup> 6 <sup>s</sup>	40 <sup>s</sup> 0 <sup>s</sup>	3 <sup>s</sup> 0
27	6 <sup>m</sup> 37 <sup>m</sup> 0 <sup>s</sup> 20	23 <sup>m</sup> 9 <sup>m</sup> 0 <sup>s</sup> 9	56 <sup>m</sup> 62 <sup>m</sup> 0 <sup>s</sup> 24	59 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 2	40	3 <sup>s</sup> 0
Dec. 7	6 <sup>s</sup> 55 <sup>s</sup> 0 <sup>m</sup> 18	23 <sup>s</sup> 0 <sup>s</sup> 0 <sup>m</sup> 9	56 <sup>s</sup> 84 <sup>s</sup> 0 <sup>m</sup> 22	59 <sup>s</sup> 4 <sup>s</sup> 0 <sup>m</sup> 2	40	3 <sup>s</sup> 0
17	6 <sup>m</sup> 68 <sup>m</sup> 0 <sup>s</sup> 13	22 <sup>m</sup> 1 <sup>m</sup> 0 <sup>s</sup> 9	57 <sup>m</sup> 02 <sup>m</sup> 0 <sup>s</sup> 18	59 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 2	40	3 <sup>s</sup> 0
	0 <sup>s</sup> 10	0 <sup>s</sup> 9	0 <sup>s</sup> 13	0 <sup>s</sup> 2	40	3 <sup>s</sup> 0
27	6 <sup>s</sup> 78 <sup>s</sup>	21 <sup>s</sup> 2 <sup>s</sup>	57 <sup>s</sup> 15 <sup>s</sup>	59 <sup>s</sup> 4 <sup>s</sup>	40	3 <sup>s</sup> 0
37	6 <sup>m</sup> 83 <sup>m</sup> 0 <sup>s</sup> 05	20 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 8	57 <sup>m</sup> 24 <sup>m</sup> 0 <sup>s</sup> 1	59 <sup>m</sup> 4 <sup>m</sup> 0 <sup>s</sup> 1	40	3 <sup>s</sup> 0



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	51 (Hev.) Cephei.		$\alpha$ CANIS MAJORIS. (Sirius)		$\epsilon$ Canis Majoris.	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec. South.
	<sup>h</sup> 6 28 <sup>m</sup>	<sup>o</sup> 87 14 <sup>i</sup>	<sup>h</sup> 6 38 <sup>m</sup>	<sup>o</sup> 16 30 <sup>i</sup>	<sup>h</sup> 6 52 <sup>m</sup>	<sup>o</sup> 28 46 <sup>i</sup>
Jan. 1	54.74 <sup>s</sup>	74.1 <sup>s</sup>	33.28 <sup>s</sup>	61.7 <sup>s</sup>	45.03 <sup>s</sup>	24.1 <sup>s</sup>
11	54.92 <sup>s</sup>	77.3 <sup>s</sup>	33.33 <sup>s</sup>	64.0 <sup>s</sup>	45.09 <sup>s</sup>	26.9 <sup>s</sup>
21	54.14 <sup>s</sup>	80.5 <sup>s</sup>	33.33 <sup>s</sup>	66.1 <sup>s</sup>	45.09 <sup>s</sup>	29.6 <sup>s</sup>
31	52.51 <sup>s</sup>	83.5 <sup>s</sup>	33.29 <sup>s</sup>	67.9 <sup>s</sup>	45.04 <sup>s</sup>	32.0 <sup>s</sup>
	2.42	2.7	0.09	1.3	0.10	2.0
Feb. 10	50.09 <sup>s</sup>	86.2 <sup>s</sup>	33.20 <sup>s</sup>	69.4 <sup>s</sup>	44.94 <sup>s</sup>	34.0 <sup>s</sup>
20	46.94 <sup>s</sup>	88.5 <sup>s</sup>	33.07 <sup>s</sup>	70.7 <sup>s</sup>	44.80 <sup>s</sup>	35.8 <sup>s</sup>
Mar. 2	43.26 <sup>s</sup>	90.3 <sup>s</sup>	32.91 <sup>s</sup>	71.7 <sup>s</sup>	44.62 <sup>s</sup>	37.1 <sup>s</sup>
12	39.18 <sup>s</sup>	91.5 <sup>s</sup>	32.73 <sup>s</sup>	72.3 <sup>s</sup>	44.42 <sup>s</sup>	38.0 <sup>s</sup>
	4.31	0.7	0.20	0.3	0.22	0.0
22	34.87 <sup>s</sup>	92.2 <sup>s</sup>	32.53 <sup>s</sup>	72.6 <sup>s</sup>	44.20 <sup>s</sup>	38.6 <sup>s</sup>
Apr. 1	30.51 <sup>s</sup>	92.2 <sup>s</sup>	32.33 <sup>s</sup>	72.6 <sup>s</sup>	43.97 <sup>s</sup>	38.7 <sup>s</sup>
11	26.30 <sup>s</sup>	91.7 <sup>s</sup>	32.14 <sup>s</sup>	72.3 <sup>s</sup>	43.75 <sup>s</sup>	38.4 <sup>s</sup>
21	22.34 <sup>s</sup>	90.5 <sup>s</sup>	31.96 <sup>s</sup>	71.6 <sup>s</sup>	43.55 <sup>s</sup>	37.8 <sup>s</sup>
	3.49	1.6	0.18	0.9	0.19	1.1
May 1	18.85 <sup>s</sup>	88.9 <sup>s</sup>	31.81 <sup>s</sup>	70.7 <sup>s</sup>	43.36 <sup>s</sup>	36.7 <sup>s</sup>
11	15.90 <sup>s</sup>	86.9 <sup>s</sup>	31.69 <sup>s</sup>	69.4 <sup>s</sup>	43.20 <sup>s</sup>	35.3 <sup>s</sup>
21	13.61 <sup>s</sup>	84.4 <sup>s</sup>	31.60 <sup>s</sup>	68.0 <sup>s</sup>	43.08 <sup>s</sup>	33.6 <sup>s</sup>
31	12.05 <sup>s</sup>	81.7 <sup>s</sup>	31.55 <sup>s</sup>	66.3 <sup>s</sup>	43.00 <sup>s</sup>	31.5 <sup>s</sup>
	0.84	2.9	0.02	1.9	0.04	1.1
June 10	11.21 <sup>s</sup>	78.8 <sup>s</sup>	31.53 <sup>s</sup>	64.4 <sup>s</sup>	42.96 <sup>s</sup>	29.3 <sup>s</sup>
20	11.24 <sup>s</sup>	75.8 <sup>s</sup>	31.56 <sup>s</sup>	62.4 <sup>s</sup>	42.96 <sup>s</sup>	26.8 <sup>s</sup>
30	12.13 <sup>s</sup>	72.4 <sup>s</sup>	31.63 <sup>s</sup>	60.3 <sup>s</sup>	43.00 <sup>s</sup>	24.2 <sup>s</sup>
July 10	13.76 <sup>s</sup>	69.5 <sup>s</sup>	31.74 <sup>s</sup>	58.0 <sup>s</sup>	43.08 <sup>s</sup>	21.3 <sup>s</sup>
	2.33	2.9	0.14	2.1	0.12	1.1
20	16.09 <sup>s</sup>	66.6 <sup>s</sup>	31.88 <sup>s</sup>	55.9 <sup>s</sup>	43.20 <sup>s</sup>	18.7 <sup>s</sup>
30	19.08 <sup>s</sup>	64.0 <sup>s</sup>	32.05 <sup>s</sup>	53.9 <sup>s</sup>	43.36 <sup>s</sup>	16.2 <sup>s</sup>
Aug. 9	22.69 <sup>s</sup>	61.7 <sup>s</sup>	32.25 <sup>s</sup>	52.1 <sup>s</sup>	43.55 <sup>s</sup>	13.9 <sup>s</sup>
19	26.81 <sup>s</sup>	59.7 <sup>s</sup>	32.47 <sup>s</sup>	50.5 <sup>s</sup>	43.77 <sup>s</sup>	11.9 <sup>s</sup>
	4.57	1.7	0.24	1.3	0.24	1.1
29	31.38 <sup>s</sup>	58.0 <sup>s</sup>	32.71 <sup>s</sup>	49.2 <sup>s</sup>	44.01 <sup>s</sup>	10.2 <sup>s</sup>
Sept. 8	36.30 <sup>s</sup>	56.8 <sup>s</sup>	32.97 <sup>s</sup>	48.2 <sup>s</sup>	44.28 <sup>s</sup>	8.9 <sup>s</sup>
18	41.47 <sup>s</sup>	55.9 <sup>s</sup>	33.25 <sup>s</sup>	47.7 <sup>s</sup>	44.56 <sup>s</sup>	8.1 <sup>s</sup>
28	46.80 <sup>s</sup>	55.6 <sup>s</sup>	33.53 <sup>s</sup>	47.6 <sup>s</sup>	44.86 <sup>s</sup>	7.7 <sup>s</sup>
	5.37	0.1	0.29	0.3	0.30	0.0
Oct. 8	52.17 <sup>s</sup>	55.7 <sup>s</sup>	33.82 <sup>s</sup>	47.9 <sup>s</sup>	45.16 <sup>s</sup>	7.9 <sup>s</sup>
18	57.47 <sup>s</sup>	56.2 <sup>s</sup>	34.11 <sup>s</sup>	48.7 <sup>s</sup>	45.47 <sup>s</sup>	8.7 <sup>s</sup>
28	62.60 <sup>s</sup>	57.3 <sup>s</sup>	34.39 <sup>s</sup>	49.9 <sup>s</sup>	45.78 <sup>s</sup>	9.9 <sup>s</sup>
Nov. 7	67.41 <sup>s</sup>	58.8 <sup>s</sup>	34.66 <sup>s</sup>	51.5 <sup>s</sup>	46.07 <sup>s</sup>	11.6 <sup>s</sup>
	4.38	2.0	0.26	1.9	0.28	1.1
17	71.79 <sup>s</sup>	60.8 <sup>s</sup>	34.92 <sup>s</sup>	53.4 <sup>s</sup>	46.35 <sup>s</sup>	13.8 <sup>s</sup>
27	75.63 <sup>s</sup>	63.1 <sup>s</sup>	35.15 <sup>s</sup>	55.5 <sup>s</sup>	46.60 <sup>s</sup>	16.2 <sup>s</sup>
Dec. 7	78.81 <sup>s</sup>	65.9 <sup>s</sup>	35.35 <sup>s</sup>	57.8 <sup>s</sup>	46.82 <sup>s</sup>	18.9 <sup>s</sup>
17	81.20 <sup>s</sup>	68.9 <sup>s</sup>	35.52 <sup>s</sup>	60.2 <sup>s</sup>	47.00 <sup>s</sup>	21.8 <sup>s</sup>
	1.59	3.2	0.13	2.4	0.13	2.1
27	82.79 <sup>s</sup>	72.1 <sup>s</sup>	35.65 <sup>s</sup>	62.6 <sup>s</sup>	47.13 <sup>s</sup>	24.7 <sup>s</sup>
37	83.44 <sup>s</sup>	75.4 <sup>s</sup>	35.73 <sup>s</sup>	64.9 <sup>s</sup>	47.21 <sup>s</sup>	27.6 <sup>s</sup>



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\beta$ Geminorum.		$\alpha^2$ GEMINORUM. (Castor)		$\alpha$ CANIS MINORIS. (Procyon)	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 7 <sup>m</sup> 11	<sup>°</sup> 22 <sup>'</sup> 14	<sup>h</sup> 7 <sup>m</sup> 25	<sup>°</sup> 32 <sup>'</sup> 12	<sup>h</sup> 7 <sup>m</sup> 31	<sup>°</sup> 5 <sup>'</sup> 36
Jan. 1	10 <sup>s</sup> 37 <sup>s</sup>	63 <sup>"</sup> 4 <sup>"</sup>	2 <sup>s</sup> 02 <sup>s</sup>	33 <sup>"</sup> 1 <sup>"</sup>	27 <sup>s</sup> 45 <sup>s</sup>	11 <sup>"</sup> 1 <sup>"</sup>
11	10 <sup>s</sup> 49 <sup>s</sup> 0 <sup>s</sup> 12	63 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 0	2 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 14	33 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 5	27 <sup>s</sup> 57 <sup>s</sup> 0 <sup>s</sup> 12	9 <sup>"</sup> 9 <sup>"</sup> 1 <sup>"</sup> 2
21	10 <sup>s</sup> 55 <sup>s</sup> 0 <sup>s</sup> 06	63 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 0	2 <sup>s</sup> 24 <sup>s</sup> 0 <sup>s</sup> 08	34 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 7	27 <sup>s</sup> 57 <sup>s</sup> 0 <sup>s</sup> 08	8 <sup>"</sup> 9 <sup>"</sup> 1 <sup>"</sup> 0
31	10 <sup>s</sup> 56 <sup>s</sup> 0 <sup>s</sup> 01	63 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 2	2 <sup>s</sup> 27 <sup>s</sup> 0 <sup>s</sup> 03	35 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 8	27 <sup>s</sup> 67 <sup>s</sup> 0 <sup>s</sup> 02	8 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 9
	0 <sup>s</sup> 04	0 <sup>"</sup> 3	0 <sup>s</sup> 03	0 <sup>"</sup> 8	0 <sup>s</sup> 03	0 <sup>"</sup> 6
Feb. 10	10 <sup>s</sup> 52 <sup>s</sup>	63 <sup>"</sup> 9 <sup>"</sup>	2 <sup>s</sup> 24 <sup>s</sup>	35 <sup>"</sup> 9 <sup>"</sup>	27 <sup>s</sup> 64 <sup>s</sup>	7 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 5
20	10 <sup>s</sup> 43 <sup>s</sup> 0 <sup>s</sup> 09	64 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 4	2 <sup>s</sup> 15 <sup>s</sup> 0 <sup>s</sup> 09	36 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 9	27 <sup>s</sup> 57 <sup>s</sup> 0 <sup>s</sup> 07	6 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 3
Mar. 2	10 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 13	64 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 4	2 <sup>s</sup> 03 <sup>s</sup> 0 <sup>s</sup> 12	37 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 8	27 <sup>s</sup> 46 <sup>s</sup> 0 <sup>s</sup> 11	6 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 2
12	10 <sup>s</sup> 14 <sup>s</sup> 0 <sup>s</sup> 16	65 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 4	1 <sup>s</sup> 86 <sup>s</sup> 0 <sup>s</sup> 17	38 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 8	27 <sup>s</sup> 32 <sup>s</sup> 0 <sup>s</sup> 14	6 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 0
	0 <sup>s</sup> 17	0 <sup>"</sup> 3	0 <sup>s</sup> 19	0 <sup>"</sup> 6	0 <sup>s</sup> 16	0 <sup>"</sup> 0
Apr. 22	9 <sup>s</sup> 97 <sup>s</sup>	65 <sup>"</sup> 4 <sup>"</sup>	1 <sup>s</sup> 67 <sup>s</sup>	39 <sup>"</sup> 0 <sup>"</sup>	27 <sup>s</sup> 16 <sup>s</sup>	6 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 1
1	9 <sup>s</sup> 78 <sup>s</sup> 0 <sup>s</sup> 19	65 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 3	1 <sup>s</sup> 47 <sup>s</sup> 0 <sup>s</sup> 20	39 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 5	26 <sup>s</sup> 99 <sup>s</sup> 0 <sup>s</sup> 17	6 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 3
11	9 <sup>s</sup> 59 <sup>s</sup> 0 <sup>s</sup> 19	66 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 3	1 <sup>s</sup> 27 <sup>s</sup> 0 <sup>s</sup> 20	39 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 4	26 <sup>s</sup> 81 <sup>s</sup> 0 <sup>s</sup> 18	6 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 3
21	9 <sup>s</sup> 42 <sup>s</sup> 0 <sup>s</sup> 17	66 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 2	1 <sup>s</sup> 07 <sup>s</sup> 0 <sup>s</sup> 20	40 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 2	26 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 17	7 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 3
	0 <sup>s</sup> 15	0 <sup>"</sup> 2	0 <sup>s</sup> 17	0 <sup>"</sup> 0	0 <sup>s</sup> 15	0 <sup>"</sup> 4
May 1	9 <sup>s</sup> 27 <sup>s</sup>	66 <sup>"</sup> 4 <sup>"</sup>	0 <sup>s</sup> 90 <sup>s</sup>	40 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 1	26 <sup>s</sup> 49 <sup>s</sup>	7 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 5
11	9 <sup>s</sup> 15 <sup>s</sup> 0 <sup>s</sup> 12	66 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 1	0 <sup>s</sup> 75 <sup>s</sup> 0 <sup>s</sup> 15	40 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 1	26 <sup>s</sup> 37 <sup>s</sup> 0 <sup>s</sup> 12	8 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 5
21	9 <sup>s</sup> 06 <sup>s</sup> 0 <sup>s</sup> 09	66 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 0	0 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 11	39 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 3	26 <sup>s</sup> 27 <sup>s</sup> 0 <sup>s</sup> 10	8 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 6
31	9 <sup>s</sup> 00 <sup>s</sup> 0 <sup>s</sup> 06	66 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 1	0 <sup>s</sup> 57 <sup>s</sup> 0 <sup>s</sup> 07	39 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 4	26 <sup>s</sup> 20 <sup>s</sup> 0 <sup>s</sup> 07	9 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 7
	0 <sup>s</sup> 01	0 <sup>"</sup> 0	0 <sup>s</sup> 03	0 <sup>"</sup> 5	0 <sup>s</sup> 03	0 <sup>"</sup> 8
June 10	8 <sup>s</sup> 99 <sup>s</sup>	66 <sup>"</sup> 6 <sup>"</sup>	0 <sup>s</sup> 54 <sup>s</sup>	38 <sup>"</sup> 8 <sup>"</sup>	26 <sup>s</sup> 17 <sup>s</sup>	10 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 8
20	9 <sup>s</sup> 02 <sup>s</sup> 0 <sup>s</sup> 03	66 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 1	0 <sup>s</sup> 56 <sup>s</sup> 0 <sup>s</sup> 02	38 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 5	26 <sup>s</sup> 17 <sup>s</sup> 0 <sup>s</sup> 00	10 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 8
30	9 <sup>s</sup> 08 <sup>s</sup> 0 <sup>s</sup> 06	66 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 0	0 <sup>s</sup> 61 <sup>s</sup> 0 <sup>s</sup> 05	37 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 6	26 <sup>s</sup> 21 <sup>s</sup> 0 <sup>s</sup> 04	11 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 8
July 10	* 9 <sup>s</sup> 19 <sup>s</sup> 0 <sup>s</sup> 11	66 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 0	0 <sup>s</sup> 71 <sup>s</sup> 0 <sup>s</sup> 10	37 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 7	26 <sup>s</sup> 28 <sup>s</sup> 0 <sup>s</sup> 07	12 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 9
	0 <sup>s</sup> 15	0 <sup>"</sup> 1	* 0 <sup>s</sup> 15	0 <sup>"</sup> 7	* 0 <sup>s</sup> 11	0 <sup>"</sup> 9
20	9 <sup>s</sup> 34 <sup>s</sup>	66 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 0	0 <sup>s</sup> 86 <sup>s</sup>	36 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 7	26 <sup>s</sup> 39 <sup>s</sup>	13 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 8
30	9 <sup>s</sup> 51 <sup>s</sup> 0 <sup>s</sup> 17	66 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 1	1 <sup>s</sup> 03 <sup>s</sup> 0 <sup>s</sup> 17	35 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 7	26 <sup>s</sup> 53 <sup>s</sup> 0 <sup>s</sup> 14	14 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 7
Aug. 9	9 <sup>s</sup> 72 <sup>s</sup> 0 <sup>s</sup> 21	66 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 1	1 <sup>s</sup> 24 <sup>s</sup> 0 <sup>s</sup> 21	34 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 7	26 <sup>s</sup> 69 <sup>s</sup> 0 <sup>s</sup> 16	15 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 5
19	9 <sup>s</sup> 94 <sup>s</sup> 0 <sup>s</sup> 22	66 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 2	1 <sup>s</sup> 47 <sup>s</sup> 0 <sup>s</sup> 23	34 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 7	26 <sup>s</sup> 88 <sup>s</sup> 0 <sup>s</sup> 19	15 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 4
	0 <sup>s</sup> 25	0 <sup>"</sup> 2	0 <sup>s</sup> 26	0 <sup>"</sup> 8	0 <sup>s</sup> 21	0 <sup>"</sup> 4
29	10 <sup>s</sup> 19 <sup>s</sup>	65 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 3	1 <sup>s</sup> 73 <sup>s</sup>	33 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 7	27 <sup>s</sup> 09 <sup>s</sup>	15 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 2
Sept. 8	10 <sup>s</sup> 46 <sup>s</sup> 0 <sup>s</sup> 27	65 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 3	2 <sup>s</sup> 02 <sup>s</sup> 0 <sup>s</sup> 29	32 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 7	27 <sup>s</sup> 33 <sup>s</sup> 0 <sup>s</sup> 24	16 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 0
18	10 <sup>s</sup> 75 <sup>s</sup> 0 <sup>s</sup> 29	65 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 3	2 <sup>s</sup> 32 <sup>s</sup> 0 <sup>s</sup> 30	32 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 7	27 <sup>s</sup> 58 <sup>s</sup> 0 <sup>s</sup> 25	16 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 2
28	11 <sup>s</sup> 05 <sup>s</sup> 0 <sup>s</sup> 30	64 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 5	2 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 32	31 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 8	27 <sup>s</sup> 85 <sup>s</sup> 0 <sup>s</sup> 27	15 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 1
	0 <sup>s</sup> 31	0 <sup>"</sup> 5	0 <sup>s</sup> 34	0 <sup>"</sup> 7	0 <sup>s</sup> 28	0 <sup>"</sup> 1
Oct. 8	11 <sup>s</sup> 36 <sup>s</sup> 0 <sup>s</sup> 32	64 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 6	2 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 34	30 <sup>"</sup> 5 <sup>"</sup> 0 <sup>"</sup> 7	28 <sup>s</sup> 13 <sup>s</sup> 0 <sup>s</sup> 29	15 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 1
18	11 <sup>s</sup> 68 <sup>s</sup> 0 <sup>s</sup> 32	63 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 6	3 <sup>s</sup> 32 <sup>s</sup> 0 <sup>s</sup> 35	29 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 6	28 <sup>s</sup> 42 <sup>s</sup> 0 <sup>s</sup> 29	
28	12 <sup>s</sup> 00 <sup>s</sup> 0 <sup>s</sup> 31	63 <sup>"</sup> 1 <sup>"</sup> 0 <sup>"</sup> 7	3 <sup>s</sup> 67 <sup>s</sup> 0 <sup>s</sup> 35	29 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 5	28 <sup>s</sup> 71 <sup>s</sup> 0 <sup>s</sup> 30	
Nov. 7	12 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 31	62 <sup>"</sup> 4 <sup>"</sup> 0 <sup>"</sup> 6	4 <sup>s</sup> 02 <sup>s</sup> 0 <sup>s</sup> 34	28 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 4	29 <sup>s</sup> 01 <sup>s</sup> 0 <sup>s</sup> 21	
17	12 <sup>s</sup> 62 <sup>s</sup> 0 <sup>s</sup> 29	61 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 6	4 <sup>s</sup> 36 <sup>s</sup> 0 <sup>s</sup> 32	28 <sup>"</sup> 3 <sup>"</sup> 0 <sup>"</sup> 3	29 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 01	
27	12 <sup>s</sup> 91 <sup>s</sup> 0 <sup>s</sup> 27	61 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 5	4 <sup>s</sup> 68 <sup>s</sup> 0 <sup>s</sup> 30	28 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 1	29 <sup>s</sup> 58 <sup>s</sup> 0 <sup>s</sup> 00	
Dec. 7	13 <sup>s</sup> 18 <sup>s</sup> 0 <sup>s</sup> 23	60 <sup>"</sup> 7 <sup>"</sup> 0 <sup>"</sup> 5	4 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 27	27 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 0	29 <sup>s</sup> 83 <sup>s</sup> 0 <sup>s</sup> 00	
17	13 <sup>s</sup> 41 <sup>s</sup> 0 <sup>s</sup> 19	60 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 2	5 <sup>s</sup> 25 <sup>s</sup> 0 <sup>s</sup> 22	27 <sup>"</sup> 9 <sup>"</sup> 0 <sup>"</sup> 3	30 <sup>s</sup> 06 <sup>s</sup> 0 <sup>s</sup> 00	
27	13 <sup>s</sup> 60 <sup>s</sup> 0 <sup>s</sup> 15	60 <sup>"</sup> 0 <sup>"</sup> 0 <sup>"</sup> 2	5 <sup>s</sup> 47 <sup>s</sup> 0 <sup>s</sup> 18	28 <sup>"</sup> 2 <sup>"</sup> 0 <sup>"</sup> 4	30 <sup>s</sup> 25 <sup>s</sup> 0 <sup>s</sup> 00	
37	13 <sup>s</sup> 75 <sup>s</sup>	59 <sup>"</sup> 8 <sup>"</sup> 0 <sup>"</sup> 2	5 <sup>s</sup> 65 <sup>s</sup>	28 <sup>"</sup> 6 <sup>"</sup> 0 <sup>"</sup> 4	30 <sup>s</sup> 40 <sup>s</sup> 0 <sup>s</sup> 00	



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\beta$ GEMINORUM. (Pollux)			15 Argus.			$\epsilon$ Hydræ.		
	R. A.		Dec. North.	R. A.		Dec. South.	R. A.		Dec. North.
	<sup>h</sup> 7	<sup>m</sup> 36	<sup>o</sup> 28 <sup>i</sup> 22	<sup>h</sup> 8	<sup>m</sup> 1	<sup>o</sup> 23 <sup>i</sup> 52	<sup>h</sup> 8	<sup>m</sup> 38	<sup>o</sup> 6 <sup>i</sup> 37
Jan. 1	8 <sup>s</sup> 48	0 <sup>s</sup> 15	51 <sup>s</sup> 4	10 <sup>s</sup> 44	0 <sup>s</sup> 13	34 <sup>s</sup> 6	50 <sup>s</sup> 32	0 <sup>s</sup> 19	49 <sup>s</sup> 8
11	8 <sup>s</sup> 63	0 <sup>s</sup> 09	51 <sup>s</sup> 7	10 <sup>s</sup> 57	0 <sup>s</sup> 08	37 <sup>s</sup> 4	50 <sup>s</sup> 51	0 <sup>s</sup> 14	48 <sup>s</sup> 5
21	8 <sup>s</sup> 72	0 <sup>s</sup> 04	52 <sup>s</sup> 1	10 <sup>s</sup> 65	0 <sup>s</sup> 03	40 <sup>s</sup> 0	50 <sup>s</sup> 65	0 <sup>s</sup> 09	47 <sup>s</sup> 4
31	8 <sup>s</sup> 76	0 <sup>s</sup> 02	52 <sup>s</sup> 6	10 <sup>s</sup> 68	0 <sup>s</sup> 02	42 <sup>s</sup> 5	50 <sup>s</sup> 74	0 <sup>s</sup> 04	46 <sup>s</sup> 5
Feb. 10	8 <sup>s</sup> 74	0 <sup>s</sup> 07	53 <sup>s</sup> 2	10 <sup>s</sup> 66	0 <sup>s</sup> 08	44 <sup>s</sup> 8	50 <sup>s</sup> 78	0 <sup>s</sup> 01	45 <sup>s</sup> 8
20	8 <sup>s</sup> 67	0 <sup>s</sup> 12	54 <sup>s</sup> 0	10 <sup>s</sup> 58	0 <sup>s</sup> 11	46 <sup>s</sup> 7	50 <sup>s</sup> 77	0 <sup>s</sup> 05	45 <sup>s</sup> 4
Mar. 2	8 <sup>s</sup> 55	0 <sup>s</sup> 15	54 <sup>s</sup> 7	10 <sup>s</sup> 47	0 <sup>s</sup> 15	48 <sup>s</sup> 3	50 <sup>s</sup> 72	0 <sup>s</sup> 09	45 <sup>s</sup> 1
12	8 <sup>s</sup> 40	0 <sup>s</sup> 18	55 <sup>s</sup> 4	10 <sup>s</sup> 32	0 <sup>s</sup> 17	49 <sup>s</sup> 6	50 <sup>s</sup> 63	0 <sup>s</sup> 12	45 <sup>s</sup> 0
22	8 <sup>s</sup> 22	0 <sup>s</sup> 19	56 <sup>s</sup> 0	10 <sup>s</sup> 15	0 <sup>s</sup> 19	50 <sup>s</sup> 6	50 <sup>s</sup> 51	0 <sup>s</sup> 15	45 <sup>s</sup> 1
Apr. 1	8 <sup>s</sup> 03	0 <sup>s</sup> 19	56 <sup>s</sup> 5	9 <sup>s</sup> 96	0 <sup>s</sup> 20	51 <sup>s</sup> 2	50 <sup>s</sup> 36	0 <sup>s</sup> 15	45 <sup>s</sup> 3
11	7 <sup>s</sup> 84	0 <sup>s</sup> 19	56 <sup>s</sup> 9	9 <sup>s</sup> 76	0 <sup>s</sup> 19	51 <sup>s</sup> 4	50 <sup>s</sup> 21	0 <sup>s</sup> 16	45 <sup>s</sup> 6
21	7 <sup>s</sup> 65	0 <sup>s</sup> 17	57 <sup>s</sup> 2	9 <sup>s</sup> 57	0 <sup>s</sup> 19	51 <sup>s</sup> 2	50 <sup>s</sup> 05	0 <sup>s</sup> 15	46 <sup>s</sup> 0
May 1	7 <sup>s</sup> 48	0 <sup>s</sup> 14	57 <sup>s</sup> 4	9 <sup>s</sup> 38	0 <sup>s</sup> 17	50 <sup>s</sup> 8	49 <sup>s</sup> 90	0 <sup>s</sup> 14	46 <sup>s</sup> 4
11	7 <sup>s</sup> 34	0 <sup>s</sup> 11	57 <sup>s</sup> 4	9 <sup>s</sup> 21	0 <sup>s</sup> 14	49 <sup>s</sup> 9	49 <sup>s</sup> 76	0 <sup>s</sup> 13	46 <sup>s</sup> 9
21	7 <sup>s</sup> 23	0 <sup>s</sup> 08	57 <sup>s</sup> 3	9 <sup>s</sup> 07	0 <sup>s</sup> 12	48 <sup>s</sup> 8	49 <sup>s</sup> 63	0 <sup>s</sup> 10	47 <sup>s</sup> 5
31	7 <sup>s</sup> 15	0 <sup>s</sup> 04	57 <sup>s</sup> 1	8 <sup>s</sup> 95	0 <sup>s</sup> 08	47 <sup>s</sup> 3	49 <sup>s</sup> 53	0 <sup>s</sup> 07	48 <sup>s</sup> 2
June 10	7 <sup>s</sup> 11	0 <sup>s</sup> 01	56 <sup>s</sup> 8	8 <sup>s</sup> 87	0 <sup>s</sup> 05	45 <sup>s</sup> 6	49 <sup>s</sup> 46	0 <sup>s</sup> 04	48 <sup>s</sup> 8
20	7 <sup>s</sup> 12	0 <sup>s</sup> 04	56 <sup>s</sup> 5	8 <sup>s</sup> 82	0 <sup>s</sup> 02	43 <sup>s</sup> 7	49 <sup>s</sup> 42	0 <sup>s</sup> 02	49 <sup>s</sup> 5
30	7 <sup>s</sup> 16	0 <sup>s</sup> 08	56 <sup>s</sup> 1	8 <sup>s</sup> 80	0 <sup>s</sup> 02	41 <sup>s</sup> 7	49 <sup>s</sup> 40	0 <sup>s</sup> 02	50 <sup>s</sup> 1
July 10	7 <sup>s</sup> 24	0 <sup>s</sup> 13	55 <sup>s</sup> 6	8 <sup>s</sup> 82	0 <sup>s</sup> 05	39 <sup>s</sup> 5	49 <sup>s</sup> 42	0 <sup>s</sup> 04	50 <sup>s</sup> 8
20	7 <sup>s</sup> 37	0 <sup>s</sup> 16	55 <sup>s</sup> 1	8 <sup>s</sup> 87	0 <sup>s</sup> 10	37 <sup>s</sup> 2	49 <sup>s</sup> 46	0 <sup>s</sup> 07	51 <sup>s</sup> 4
30	7 <sup>s</sup> 53	0 <sup>s</sup> 18	54 <sup>s</sup> 6	8 <sup>s</sup> 97	0 <sup>s</sup> 12	34 <sup>s</sup> 7	49 <sup>s</sup> 53	0 <sup>s</sup> 11	51 <sup>s</sup> 9
Aug. 9	7 <sup>s</sup> 71	0 <sup>s</sup> 22	54 <sup>s</sup> 0	9 <sup>s</sup> 09	0 <sup>s</sup> 16	32 <sup>s</sup> 6	49 <sup>s</sup> 64	0 <sup>s</sup> 14	52 <sup>s</sup> 4
19	7 <sup>s</sup> 93	0 <sup>s</sup> 24	53 <sup>s</sup> 4	9 <sup>s</sup> 25	0 <sup>s</sup> 18	30 <sup>s</sup> 6	49 <sup>s</sup> 78	0 <sup>s</sup> 16	52 <sup>s</sup> 8
29	8 <sup>s</sup> 17	0 <sup>s</sup> 26	52 <sup>s</sup> 8	9 <sup>s</sup> 43	0 <sup>s</sup> 21	29 <sup>s</sup> 0	49 <sup>s</sup> 94	0 <sup>s</sup> 18	52 <sup>s</sup> 9
Sept. 8	8 <sup>s</sup> 43	0 <sup>s</sup> 29	52 <sup>s</sup> 1	9 <sup>s</sup> 64	0 <sup>s</sup> 24	27 <sup>s</sup> 6	50 <sup>s</sup> 12	0 <sup>s</sup> 21	52 <sup>s</sup> 9
18	8 <sup>s</sup> 72	0 <sup>s</sup> 30	51 <sup>s</sup> 4	9 <sup>s</sup> 88	0 <sup>s</sup> 27	26 <sup>s</sup> 6	50 <sup>s</sup> 33	0 <sup>s</sup> 24	52 <sup>s</sup> 7
28	9 <sup>s</sup> 02	0 <sup>s</sup> 32	50 <sup>s</sup> 6	10 <sup>s</sup> 15	0 <sup>s</sup> 28	26 <sup>s</sup> 0	50 <sup>s</sup> 57	0 <sup>s</sup> 25	52 <sup>s</sup> 2
Oct. 8	9 <sup>s</sup> 34	0 <sup>s</sup> 33	49 <sup>s</sup> 9	10 <sup>s</sup> 43	0 <sup>s</sup> 30	25 <sup>s</sup> 9	50 <sup>s</sup> 82	0 <sup>s</sup> 28	51 <sup>s</sup> 5
18	9 <sup>s</sup> 67	0 <sup>s</sup> 34	49 <sup>s</sup> 1	10 <sup>s</sup> 73	0 <sup>s</sup> 30	26 <sup>s</sup> 3	51 <sup>s</sup> 10	0 <sup>s</sup> 29	50 <sup>s</sup> 6
28	10 <sup>s</sup> 01	0 <sup>s</sup> 34	48 <sup>s</sup> 3	11 <sup>s</sup> 03	0 <sup>s</sup> 31	27 <sup>s</sup> 2	51 <sup>s</sup> 39	0 <sup>s</sup> 31	49 <sup>s</sup> 5
Nov. 7	10 <sup>s</sup> 35	0 <sup>s</sup> 33	47 <sup>s</sup> 6	11 <sup>s</sup> 34	0 <sup>s</sup> 31	28 <sup>s</sup> 6	51 <sup>s</sup> 70	0 <sup>s</sup> 31	48 <sup>s</sup> 2
17	10 <sup>s</sup> 68	0 <sup>s</sup> 32	47 <sup>s</sup> 0	11 <sup>s</sup> 65	0 <sup>s</sup> 29	30 <sup>s</sup> 4	52 <sup>s</sup> 01	0 <sup>s</sup> 31	46 <sup>s</sup> 7
27	11 <sup>s</sup> 00	0 <sup>s</sup> 30	46 <sup>s</sup> 4	11 <sup>s</sup> 94	0 <sup>s</sup> 28	32 <sup>s</sup> 6	52 <sup>s</sup> 32	0 <sup>s</sup> 30	45 <sup>s</sup> 1
Dec. 7	11 <sup>s</sup> 30	0 <sup>s</sup> 26	46 <sup>s</sup> 1	12 <sup>s</sup> 22	0 <sup>s</sup> 24	35 <sup>s</sup> 0	52 <sup>s</sup> 62	0 <sup>s</sup> 27	43 <sup>s</sup> 6
17	11 <sup>s</sup> 56	0 <sup>s</sup> 23	45 <sup>s</sup> 8	12 <sup>s</sup> 46	0 <sup>s</sup> 20	37 <sup>s</sup> 6	52 <sup>s</sup> 89	0 <sup>s</sup> 25	42 <sup>s</sup> 0
27	11 <sup>s</sup> 79	0 <sup>s</sup> 18	45 <sup>s</sup> 8	12 <sup>s</sup> 66	0 <sup>s</sup> 16	40 <sup>s</sup> 4	53 <sup>s</sup> 14	0 <sup>s</sup> 21	40 <sup>s</sup> 5
37	11 <sup>s</sup> 97	0 <sup>s</sup> 14	45 <sup>s</sup> 9	12 <sup>s</sup> 82	0 <sup>s</sup> 14	43 <sup>s</sup> 2	53 <sup>s</sup> 35	0 <sup>s</sup> 17	39 <sup>s</sup> 1

APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	♌ Ursæ Majoris.		♐ Argus.		♒ HYDRÆ.	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec. South.
	<sup>h</sup> 8 <sup>m</sup> 48	<sup>°</sup> 48 <sup>'</sup> 37	<sup>h</sup> 9 <sup>m</sup> 13	<sup>°</sup> 58 <sup>'</sup> 38	<sup>h</sup> 9 <sup>m</sup> 20	<sup>°</sup> 8 <sup>'</sup> 0
Jan. 1	55° 21' 0.28"	23° 0' 1.1"	6° 9' 41.7"	41° 7' 3.6"	13° 45' 42.2"	42° 2' 2.2"
11	55° 49' 0.22"	24° 1' 1.3"	7° 20' 45.3"	45° 3' 3.7"	13° 66' 44.4"	44° 4' 2.0"
21	55° 71' 0.14"	25° 4' 1.6"	7° 37' 49.0"	49° 0' 3.7"	13° 83' 46.4"	46° 4' 1.9"
31	55° 85' 0.07"	27° 0' 1.8"	7° 47' 52.7"	52° 7' 3.6"	13° 96' 48.3"	48° 3' 1.6"
Feb. 10	55° 92' 0.01"	28° 8' 1.8"	7° 48' 56.3"	56° 3' 3.5"	14° 03' 49.9"	49° 9' 1.5"
20	55° 91' 0.07"	30° 6' 1.9"	7° 41' 59.8"	59° 8' 3.3"	14° 05' 51.4"	51° 4' 1.1"
Mar. 2	55° 84' 0.13"	32° 5' 1.8"	7° 27' 63.1"	63° 1' 2.9"	14° 03' 52.5"	52° 5' 1.0"
12	55° 71' 0.18"	34° 3' 1.6"	7° 06' 66.0"	66° 0' 2.6"	13° 97' 53.5"	53° 5' 0.6"
22	55° 53' 0.21"	35° 9' 1.5"	6° 79' 68.6"	68° 6' 2.1"	13° 87' 54.1"	54° 1' 0.4"
Apr. 1	55° 32' 0.24"	37° 4' 1.1"	6° 49' 70.7"	70° 7' 1.7"	13° 75' 54.5"	54° 5' 0.2"
11	55° 08' 0.25"	38° 5' 0.9"	6° 15' 72.4"	72° 4' 1.2"	13° 61' 54.7"	54° 7' 0.0"
21	54° 83' 0.25"	39° 4' 0.4"	5° 79' 73.6"	73° 6' 0.7"	13° 46' 54.7"	54° 7' 0.3"
May 1	54° 58' 0.23"	39° 8' 0.2"	5° 42' 74.3"	74° 3' 0.2"	13° 31' 54.4"	54° 4' 0.4"
11	54° 35' 0.21"	40° 0' 0.2"	5° 05' 74.5"	74° 5' 0.3"	13° 17' 54.0"	54° 0' 0.6"
21	54° 14' 0.18"	39° 8' 0.5"	4° 69' 74.2"	74° 2' 0.8"	13° 04' 53.4"	53° 4' 0.8"
31	53° 96' 0.14"	39° 3' 0.8"	4° 35' 73.4"	73° 4' 1.3"	12° 92' 52.6"	52° 6' 1.0"
June 10	53° 82' 0.10"	38° 5' 1.1"	4° 04' 72.1"	72° 1' 1.8"	12° 82' 51.6"	51° 6' 1.0"
20	53° 72' 0.05"	37° 4' 1.3"	3° 77' 70.3"	70° 3' 2.1"	12° 74' 50.6"	50° 6' 1.2"
30	53° 67' 0.00"	36° 1' 1.6"	3° 54' 68.2"	68° 2' 2.5"	12° 69' 49.4"	49° 4' 1.3"
July 10	53° 67' 0.04"	34° 5' 1.7"	3° 36' 65.7"	65° 7' 2.8"	12° 66' 48.1"	48° 1' 1.2"
20	53° 71' 0.09"	32° 8' 1.8"	3° 23' 62.9"	62° 9' 2.9"	12° 66' 46.9"	46° 9' 1.3"
30	53° 80' 0.13"	31° 0' 2.1"	3° 16' 60.0"	60° 0' 3.1"	12° 69' 45.6"	45° 6' 1.2"
Aug. 9	53° 93' 0.18"	28° 9' 2.0"	3° 15' 56.9"	56° 9' 3.4"	12° 74' 44.4"	44° 4' 1.2"
19	54° 11' 0.23"	26° 9' 2.1"	3° 22' 53.5"	53° 5' 2.9"	12° 83' 43.2"	43° 2' 0.9"
29	54° 34' 0.26"	24° 8' 2.0"	3° 35' 50.6"	50° 6' 2.7"	12° 94' 42.3"	42° 3' 0.7"
Sept. 8	54° 60' 0.30"	22° 8' 2.0"	3° 55' 47.9"	47° 9' 2.4"	13° 08' 41.6"	41° 6' 0.4"
18	54° 90' 0.33"	20° 8' 2.0"	3° 81' 45.5"	45° 5' 1.9"	13° 26' 41.2"	41° 2' 0.2"
28	55° 23' 0.37"	18° 8' 1.8"	4° 13' 43.6"	43° 6' 1.5"	13° 46' 41.0"	41° 0' 0.2"
Oct. 8	55° 60' 0.40"	17° 0' 1.6"	4° 51' 42.1"	42° 1' 0.4"		
18	56° 00' 0.42"	15° 4' 1.5"	4° 93' 41.2"	41° 2' 0.4"		
28	56° 42' 0.44"	13° 9' 1.2"	5° 39' 41.0"	41° 0' 0.4"		
Nov. 7	56° 86' 0.44"	12° 7' 0.9"	5° 87' 41.4"	41° 4' 0.4"		
17	57° 30' 0.45"	11° 8' 0.6"	6° 36' 42.4"	42° 4' 0.4"		
27	57° 75' 0.43"	11° 2' 0.3"	6° 84' 44.1"	44° 1' 0.4"		
Dec. 7	58° 18' 0.37"	10° 9' 0.5"	7° 29' 46.4"	46° 4' 0.4"		
17	58° 58' 0.32"	11° 1' 0.8"	7° 71' 49.4"	49° 4' 0.4"		
27	58° 95' 0.32"	11° 6' 0.8"	8° 07' 52.4"	52° 4' 0.4"		
37	59° 27' 0.32"	12° 4' 0.8"	8° 36' 55.4"	55° 4' 0.4"		



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\theta$ Ursæ Majoris.		$\epsilon$ Leonis.		$\alpha$ LEONIS. (Regulus)	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. N.
	<sup>h</sup> 9 <sup>m</sup> 22	<sup>o</sup> 52 <sup>'</sup> 20	<sup>h</sup> 9 <sup>m</sup> 37	<sup>o</sup> 24 <sup>'</sup> 27	<sup>h</sup> 10 <sup>m</sup> 0	<sup>o</sup> 12
Jan. 1	47° 98' 0.34	73° 4' 1.0	19° 92' 0.26	31° 8' 0.5	22° 91' 0.25	47° 3'
11	48° 32' 0.27	74° 4' 1.3	20° 18' 0.22	34° 3' 0.3	23° 16' 0.22	46° 3'
21	48° 59' 0.20	75° 7' 1.6	20° 40' 0.16	34° 0' 0.0	23° 38' 0.18	45° 1'
31	48° 79' 0.12	77° 3' 1.9	20° 56' 0.11	34° 0' 0.3	23° 56' 0.12	44° 3'
Feb. 10	48° 91' 0.05	79° 2' 2.1	20° 67' 0.06	34° 3' 0.5	23° 68' 0.07	43° 5'
20	48° 96' 0.03	81° 3' 2.1	20° 73' 0.00	34° 8' 0.7	23° 75' 0.03	43° 1'
Mar. 2	48° 93' 0.10	83° 4' 2.1	20° 73' 0.04	35° 5' 0.9	23° 78' 0.02	43° 4'
12	48° 83' 0.16	85° 5' 2.0	20° 69' 0.08	36° 4' 0.9	23° 76' 0.06	43° 1'
22	48° 67' 0.21	87° 5' 1.8	20° 61' 0.12	37° 3' 1.0	23° 70' 0.09	44° 1'
Apr. 1	48° 46' 0.24	89° 3' 1.5	20° 49' 0.14	38° 3' 0.9	23° 61' 0.11	44° 1'
11	48° 22' 0.26	90° 8' 1.1	20° 35' 0.15	39° 2' 0.9	23° 50' 0.13	45° 1'
21	47° 96' 0.26	91° 9' 0.9	20° 20' 0.15	40° 1' 0.8	23° 37' 0.13	45° 1'
May 1	47° 70' 0.27	92° 8' 0.4	20° 05' 0.16	40° 9' 0.7	23° 24' 0.14	46° 1'
11	47° 43' 0.24	93° 2' 0.1	19° 89' 0.14	41° 6' 0.5	23° 10' 0.13	47° 1'
21	47° 19' 0.22	93° 3' 0.4	19° 75' 0.13	42° 1' 0.4	22° 97' 0.12	47° 1'
31	46° 97' 0.19	92° 9' 0.7	19° 62' 0.10	42° 5' 0.2	22° 85' 0.10	48° 1'
June 10	46° 78' 0.15	92° 2' 1.0	19° 52' 0.09	42° 7' 0.0	22° 75' 0.09	49° 1'
20	46° 63' 0.10	91° 2' 1.3	19° 43' 0.06	42° 7' 0.1	22° 66' 0.07	49° 1'
30	46° 53' 0.06	89° 9' 1.6	19° 37' 0.03	42° 6' 0.2	22° 59' 0.05	49° 1'
July 10	46° 47' 0.02	88° 3' 1.9	19° 34' 0.00	42° 4' 0.4	22° 51' 0.02	50° 1'
20	46° 45' 0.04	86° 4' 2.0	19° 34' 0.02	42° 0' 0.5	22° 52' 0.00	50° 1'
30	46° 49' 0.08	84° 4' 2.2	19° 36' 0.05	41° 5' 0.7	22° 52' 0.03	50° 1'
Aug. 9	46° 57' 0.14	82° 2' 2.6	19° 41' 0.10	40° 8' 0.9	22° 55' 0.05	50° 1'
19	46° 71' 0.18	79° 6' 2.4	19° 51' 0.11	39° 9' 1.0	22° 60' 0.09	50° 1'
29	46° 89' 0.23	77° 2' 2.4	19° 62' 0.15	38° 9' 1.2	22° 69' 0.12	49° 1'
Sept. 8	47° 12' 0.27	74° 8' 2.4	19° 77' 0.18	37° 7' 1.3	22° 81' 0.14	49° 1'
18	47° 39' 0.32	72° 4' 2.4	19° 95' 0.21	36° 4' 1.4	22° 95' 0.18	48° 1'
28	47° 71' 0.35	70° 0' 2.2	20° 16' 0.24	35° 0' 1.5	23° 13' 0.20	47° 1'
Oct. 8	48° 06' 0.40	67° 8' 2.1	20° 40' 0.27	33° 5' 1.6	23° 33' 0.24	46° 1'
18	48° 46' 0.43	65° 7' 1.9	20° 67' 0.30	31° 9' 1.7	23° 57' 0.27	45° 1'
28	48° 89' 0.45	63° 8' 1.6	20° 97' 0.32	30° 2' 1.7	23° 84' 0.29	43° 1'
Nov. 7	49° 34' 0.47	62° 2' 1.3	21° 29' 0.33	28° 5' 1.6	24° 13' 0.31	42° 1'
17	49° 81' 0.48	60° 9' 0.9	21° 62' 0.35	26° 9' 1.6	24° 44' 0.32	40° 1'
27	50° 29' 0.47	60° 0' 0.6	21° 97' 0.34	25° 3' 1.4	24° 76' 0.33	38° 1'
Dec. 7	50° 76' 0.46	59° 4' 0.1	22° 31' 0.34	23° 9' 1.3	25° 09' 0.32	36° 1'
17	51° 22' 0.42	59° 3' 0.3	22° 65' 0.31	22° 6' 1.0	25° 41' 0.31	35° 1'
27	51° 64' 0.37	59° 6' 0.8	22° 96' 0.28	21° 6' 0.7	25° 72' 0.28	33° 1'
37	52° 01' 0.37	60° 4' 0.8	23° 24' 0.28	20° 9' 0.7	26° 00' 0.28	32° 1'

APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\eta$ Argus.		$\alpha$ URSE MAJORIS.		$\delta$ LEONIS.	
	R. A.	Dec. South.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 10 <sup>m</sup> 39	<sup>°</sup> 58 <sup>'</sup> 53	<sup>h</sup> 10 <sup>m</sup> 54	<sup>°</sup> 62 <sup>'</sup> 33	<sup>h</sup> 11 <sup>m</sup> 6	<sup>°</sup> 21 <sup>'</sup> 20
Jan. 1	16 <sup>s</sup> 99 <sup>s</sup>	33 <sup>s</sup> 1 <sup>s</sup>	25 <sup>s</sup> 31 <sup>s</sup>	18 <sup>s</sup> 3 <sup>s</sup>	7 <sup>s</sup> 22 <sup>s</sup>	34 <sup>s</sup> 3 <sup>s</sup>
11	17 38	36 2	25 85	18 8	7 53	33 0
21	17 72	39 5	26 34	19 8	7 81	32 1
31	17 98	43 0	26 75	21 3	8 05	31 6
Feb. 10	18 16	46 7	27 07	23 2	8 25	31 4
20	18 27	50 3	27 31	25 5	8 40	31 5
Mar. 2	18 30	53 9	27 44	28 1	8 50	31 9
12	18 26	57 3	27 48	30 8	8 55	32 6
22	18 15	60 5	27 43	33 5	8 55	33 5
pr. 1	17 99	63 4	27 30	36 1	8 52	34 5
11	17 78	66 0	27 10	38 5	8 46	35 6
21	17 52	68 1	26 84	40 6	8 37	36 8
May 1	17 24	69 8	26 54	42 5	8 26	37 9
11	16 93	71 1	26 20	43 9	8 14	38 9
21	16 61	71 9	25 86	44 8	8 02	39 8
31	16 28	72 1	25 51	45 3	7 89	40 6
June 10	15 96	71 9	25 18	45 3	7 77	41 3
20	15 64	71 2	24 86	44 8	7 66	41 8
30	15 34	70 0	24 58	43 8	7 55	42 0
July 10	15 07	68 4	24 33	42 4	7 47	42 1
20	14 83	66 4	24 13	40 6	7 39	42 0
30	14 64	64 0	23 97	38 5	7 34	41 7
Aug. 9	14 50	61 4	23 87	36 0	7 30	41 2
19	14 41	58 6	23 83	33 2	7 29	40 5
29	14 38	55 7	23 84	30 3	7 29	39 5
Sept. 8	14 43	52 6	23 93	26 8	7 35	38 3
18	14 55	49 9	24 09	23 6	7 44	36 9
28	14 74	47 4	24 31	20 3	7 56	35 3
Oct. 8	15 01	45 3	24 60	17 1	7 56	33 6
18	15 34	43 6	24 95	14 0	7 56	31 7
28	15 74	42 4	25 37	11 1	7 56	29 6
Nov. 7	16 18	41 9	25 85	8 1	7 56	27 5
17	16 66	41 9	26 38	5 5	7 56	25 3
27	17 17	42 6	26 95	3 5	7 56	23 2
Dec. 7	17 68	43 8	27 55	1 5	7 56	21 1
17	18 17	45 7	28 15	0 5	7 56	19 2
27	18 64	48 1	28 75	0 5	7 56	17 2
37	19 07	50 9	29 31	0 5	7 56	15 2



APPARENT PLACES OF THE PRINCIPAL FIXED STARS  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\delta$ Hydre et Crateris.		$\beta$ LEONIS.		$\gamma$ URSÆ MAJ.	
	R. A.	Dec. South.	R. A.	Dec. North.	R. A.	Dec.
	<sup>h</sup> 11 <sup>m</sup> 11	<sup>o</sup> 13 <sup>'</sup> 57	<sup>h</sup> 11 <sup>m</sup> 41	<sup>o</sup> 15 <sup>'</sup> 24	<sup>h</sup> 11 <sup>m</sup> 45	<sup>o</sup> 54
Jan. 1	50° 72' 0" 29	58° 5' 0" 23	23° 90' 0" 32	33° 5' 0" 16	54° 22' 0" 48	29
11	51° 01' 0" 26	60° 8' 0" 24	24° 22' 0" 29	31° 9' 0" 13	54° 70' 0" 44	29
21	51° 27' 0" 23	63° 2' 0" 22	24° 51' 0" 25	30° 6' 0" 10	55° 14' 0" 39	29
31	51° 50' 0" 18	65° 4' 0" 21	24° 76' 0" 22	29° 6' 0" 7	55° 53' 0" 34	29
Feb. 10	51° 68' 0" 14	67° 5' 0" 19	24° 98' 0" 17	28° 9' 0" 3	55° 87' 0" 27	31
20	51° 82' 0" 09	69° 4' 0" 17	25° 15' 0" 13	28° 6' 0" 0	56° 14' 0" 20	32
Mar. 2	51° 91' 0" 05	71° 1' 0" 15	25° 28' 0" 09	28° 6' 0" 3	56° 34' 0" 13	34
12	51° 96' 0" 00	72° 6' 0" 12	25° 37' 0" 04	28° 9' 0" 6	56° 47' 0" 05	37
22	51° 96' 0" 02	73° 8' 0" 9	25° 41' 0" 01	29° 5' 0" 7	56° 52' 0" 01	39
Apr. 1	51° 94' 0" 06	74° 7' 0" 7	25° 42' 0" 03	30° 2' 0" 9	56° 51' 0" 08	42
11	51° 88' 0" 08	75° 4' 0" 5	25° 39' 0" 05	31° 1' 0" 10	56° 43' 0" 13	44
21	51° 80' 0" 09	75° 9' 0" 2	25° 34' 0" 09	32° 1' 0" 10	56° 30' 0" 17	47
May 1	51° 71' 0" 11	76° 1' 0" 0	25° 25' 0" 09	33° 1' 0" 10	56° 13' 0" 21	49
11	51° 60' 0" 12	76° 1' 0" 1	25° 16' 0" 11	34° 1' 0" 9	55° 92' 0" 23	51
21	51° 48' 0" 12	76° 0' 0" 4	25° 05' 0" 11	35° 0' 0" 9	55° 69' 0" 24	52
31	51° 36' 0" 11	75° 6' 0" 6	24° 94' 0" 11	35° 9' 0" 8	55° 45' 0" 25	53
June 10	51° 25' 0" 12	75° 0' 0" 7	24° 83' 0" 11	36° 7' 0" 7	55° 20' 0" 25	54
20	51° 13' 0" 10	74° 3' 0" 9	24° 72' 0" 11	37° 4' 0" 5	54° 95' 0" 24	54
30	51° 03' 0" 10	73° 4' 0" 10	24° 61' 0" 10	37° 9' 0" 3	54° 71' 0" 22	54
July 10	50° 93' 0" 09	72° 4' 0" 11	24° 51' 0" 09	38° 2' 0" 2	54° 49' 0" 21	53
20	50° 84' 0" 06	71° 3' 0" 12	24° 42' 0" 08	38° 4' 0" 0	54° 28' 0" 17	52
30	50° 78' 0" 05	70° 1' 0" 12	24° 34' 0" 07	38° 4' 0" 1	54° 11' 0" 15	51
Aug. 9	50° 73' 0" 03	68° 9' 0" 11	24° 27' 0" 04	38° 3' 0" 4	53° 96' 0" 10	49
19	50° 70' 0" 00	67° 8' 0" 11	24° 23' 0" 02	37° 9' 0" 6	53° 86' 0" 07	47
29	50° 70' 0" 03	66° 7' 0" 9	24° 21' 0" 01	37° 3' 0" 8	53° 79' 0" 02	44
Sept. 8	50° 73' 0" 07	65° 8' 0" 8	24° 22' 0" 04	36° 5' 0" 12	53° 77' 0" 03	41
18	50° 80' 0" 10	65° 0' 0" 5	24° 26' 0" 07	35° 3' 0" 12	53° 80' 0" 09	38
28	50° 90' 0" 14	64° 5' 0" 2	24° 33' 0" 12	34° 1' 0" 15	53° 89' 0" 15	35
Oct. 8	51° 04' 0" 18	64° 3' 0" 1	24° 45' 0" 15	32° 6' 0" 17	54° 04' 0" 21	32
18	51° 22' 0" 22	64° 4' 0" 5	24° 60' 0" 19	30° 9' 0" 19	54° 25' 0" 27	28
28	51° 44' 0" 26	64° 9' 0" 9	24° 79' 0" 24	29° 0' 0" 21	54° 52' 0" 33	25
Nov. 7	51° 70' 0" 28	65° 8' 0" 12	25° 03' 0" 26	26° 9' 0" 21	54° 83' 0" 38	22
17	51° 98' 0" 31	67° 0' 0" 15	25° 29' 0" 30	24° 8' 0" 22	55° 23' 0" 43	19
27	52° 29' 0" 32	68° 5' 0" 18	25° 59' 0" 32	22° 6' 0" 22	55° 66' 0" 46	17
Dec. 7	52° 61' 0" 33	70° 3' 0" 21	25° 91' 0" 33	20° 4' 0" 22	56° 12' 0" 49	14
17	52° 94' 0" 32	72° 4' 0" 22	26° 24' 0" 33	18° 2' 0" 19	56° 61' 0" 49	13
27	53° 26' 0" 31	74° 6' 0" 24	26° 57' 0" 33	16° 3' 0" 18	57° 10' 0" 49	11
37	53° 57' 0" 31	77° 0' 0" 24	26° 90' 0" 33	14° 5' 0" 18	57° 59' 0" 49	11



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\beta$ Chamæleontis.		$\alpha^1$ Crucis.		$\beta$ Corvi.	
	R. A.	Dec. South.	R. A.	Dec. South.	R. A.	Dec. South.
	<sup>h</sup> 12	<sup>m</sup> 9	<sup>h</sup> 12	<sup>m</sup> 18	<sup>h</sup> 12	<sup>m</sup> 26
	<sup>s</sup> 55	<sup>s</sup> 21	<sup>s</sup> 28	<sup>s</sup> 38	<sup>s</sup> 30	<sup>s</sup> 49
an. 1	55	21	28	38	62	5
11	58	23	33	40	55	7
21	72	25	34	42	27	9
31	64	28	80	45	55	3
eb. 10	42	31	20	48	30	58
20	05	35	53	51	02	60
ar. 2	52	38	78	55	19	62
12	82	42	96	58	32	64
22	96	46	07	62	41	66
pr. 1	93	50	11	65	46	68
11	74	53	08	68	48	69
21	41	57	99	71	47	70
ay 1	93	60	84	74	43	71
11	34	62	64	76	37	71
21	64	65	40	78	29	72
31	84	67	12	79	20	72
une 10	97	68	81	80	09	72
20	05	69	48	81	98	71
30	10	69	13	81	86	71
uly 10	14	69	78	81	73	70
20	21	68	44	80	61	69
30	33	67	11	78	49	68
ug. 9	53	65	80	77	38	67
19	84	63	54	74	28	66
29	29	60	33	72	21	65
pt. 8	90	57	18	69	16	64
18	69	54	11	67	14	62
28	69	51	12	64	17	61
st. 8	90	48	22	61	24	61
18	32	45	42	59	35	60
28	93	43	70	57	51	60
ov. 7	72	41	06	55	72	60
17	65	39	50	54	97	61
27	71	38	00	53	26	62
ec. 7	86	38	54	53	58	63
17	05	38	11	54	91	63
27	24	39	69	55	25	66
37	40	41	25	57	60	69



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	12 Canum Venaticorum.		α VIRGINIS. (Spica)		η URSAE MAJORIS.	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec. North.
	<sup>h</sup> 12 <sup>m</sup> 48	<sup>°</sup> 39 <sup>'</sup> 7	<sup>h</sup> 13 <sup>m</sup> 17	<sup>°</sup> 10 <sup>'</sup> 22	<sup>h</sup> 13 <sup>m</sup> 41	<sup>°</sup> 50 <sup>'</sup> 3
Jan. 1	59°13' <sup>s</sup>	37°4' <sup>"</sup>	17°04' <sup>s</sup>	28°4' <sup>"</sup>	35°85' <sup>s</sup>	39°3' <sup>"</sup>
11	59°52' 0.39	35°9' 1.5	17°37' 0.33	30°4' 2.0	36°29' 0.44	37°5' 1.3
21	59°89' 0.37	34°9' 1.0	17°69' 0.32	32°4' 2.0	36°72' 0.43	36°2' 1.3
31	60°24' 0.35	34°4' 0.5	17°99' 0.30	34°3' 1.9	36°72' 0.43	35°4' 0.3
	0.32	0.0	0.27	1.8	0.40	0.0
Feb. 10	60°56' 0.27	34°4' 0.6	18°26' 0.24	36°1' 1.7	37°55' 0.36	35°4' 0.5
20	60°83' 0.23	35°0' 1.0	18°50' 0.22	37°8' 1.4	37°91' 0.33	35°9' 1.1
Mar. 2	61°06' 0.18	36°0' 1.4	18°72' 0.17	39°2' 1.2	38°24' 0.27	37°0' 1.6
12	61°24' 0.13	37°4' 1.8	18°89' 0.14	40°4' 1.0	38°51' 0.21	38°6' 2.0
	0.07	2.0	0.11	0.8	0.16	2.3
Apr. 1	61°44' 0.03	41°2' 2.1	19°14' 0.07	42°2' 0.5	38°88' 0.10	42°9' 2.6
11	61°47' 0.01	43°3' 2.2	19°21' 0.04	42°7' 0.4	38°98' 0.05	45°5' 2.7
21	61°46' 0.05	45°5' 2.2	19°25' 0.02	43°1' 0.1	39°03' 0.01	48°2' 2.7
	0.08	2.1	0.02	0.0	0.05	2.6
May 1	61°41' 0.11	47°7' 2.1	19°27' 0.03	43°2' 0.1	39°02' 0.10	50°9' 2.4
11	61°33' 0.13	49°8' 1.9	19°22' 0.05	43°1' 0.2	38°97' 0.14	53°5' 2.4
21	61°22' 0.14	51°7' 1.6	19°17' 0.07	42°9' 0.4	38°87' 0.17	55°9' 2.2
31	61°09' 0.16	53°3' 1.3	19°10' 0.09	42°5' 0.4	38°73' 0.19	58°1' 1.9
	0.17	1.0	0.10	0.5	0.22	1.3
June 10	60°95' 0.17	54°6' 0.7	18°91' 0.11	41°6' 0.6	38°37' 0.23	61°5' 1.1
20	60°79' 0.17	56°3' 0.3	18°80' 0.11	41°0' 0.6	38°15' 0.24	62°6' 0.6
30	60°62' 0.16	56°6' 0.5	18°69' 0.12	40°4' 0.7	37°92' 0.24	63°2' 0.2
July 10	60°28' 0.15	56°0' 0.9	18°57' 0.12	39°7' 0.7	37°68' 0.24	63°4' 0.3
20	60°12' 0.13	55°1' 1.2	18°45' 0.12	39°0' 0.6	37°44' 0.24	63°1' 0.7
Aug. 9	59°97' 0.11	53°9' 1.6	18°33' 0.10	38°4' 0.6	37°20' 0.23	62°4' 1.3
19	59°73' 0.09	52°3' 1.9	18°23' 0.08	37°8' 0.5	36°97' 0.21	61°2' 1.6
	0.05	2.2	0.06	0.4	0.18	1.6
Sept. 8	59°64' 0.01	50°4' 2.5	18°15' 0.06	37°3' 0.4	36°76' 0.18	59°6' 2.0
18	59°59' 0.04	48°2' 3.0	18°09' 0.02	36°9' 0.3	36°58' 0.15	57°6' 2.4
28	59°58' 0.04	45°7' 3.0	18°07' 0.01	36°6' 0.1	36°43' 0.11	55°2' 2.4
	0.08	2.9	0.06	0.3	0.06	3.0
Oct. 8	59°62' 0.08	42°7' 3.1	18°08' 0.06	36°5' 0.3	36°32' 0.11	52°4' 3.0
18	59°70' 0.14	39°8' 3.1	18°14' 0.11	36°8' 0.4	36°26' 0.00	49°4' 3.4
28	59°84' 0.19	36°7' 3.1	18°25' 0.15	37°2' 0.7	36°26' 0.06	45°8' 3.4
Nov. 7	60°03' 0.24	33°6' 3.1	18°40' 0.20	37°9' 1.1	36°32' 0.06	42°3' 3.5
	0.29	2.9	0.24	1.3	0.13	3.5
17	60°27' 0.33	30°5' 2.8	18°60' 0.27	39°0' 1.5	36°45' 0.19	38°8' 3.5
27	60°56' 0.36	27°6' 2.6	18°84' 0.32	40°3' 1.9	36°19' 0.26	35°3' 3.5
Dec. 7	60°89' 0.38	24°8' 2.2	19°11' 0.32	41°8' 1.7	36°90' 0.31	31°8' 3.3
17	61°25' 0.39	22°2' 1.8	19°41' 0.32	43°5' 2.0	37°21' 0.36	28°5' 2.9
	0.39	1.8	0.32	2.0	0.40	2.7
27	61°63' 0.39	20°0' 1.8	19°73' 0.32	45°4' 2.0	37°57' 0.43	25°6' 2.7
37	62°02' 0.39	18°2' 1.8	20°05' 0.32	47°4' 2.0	37°97' 0.43	22°9' 2.7
					38°40' 0.43	20°8' 2.7



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\eta$ Bootis.		$\beta$ Centauri.		$\alpha$ Bootis. (Arcturus)	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec. North.
	<sup>h</sup> 13 <sup>m</sup> 47	<sup>o</sup> 19 <sup>i</sup> 8	<sup>h</sup> 13 <sup>m</sup> 53	<sup>o</sup> 59 <sup>i</sup> 38	<sup>h</sup> 14 <sup>m</sup> 8	<sup>o</sup> 19 <sup>i</sup> 57
Jan. 1	31 <sup>s</sup> 41 <sup>s</sup>	64 <sup>9</sup> 2 <sup>1</sup>	16 <sup>s</sup> 44 <sup>s</sup>	22 <sup>7</sup> 2 <sup>1</sup>	47 <sup>s</sup> 99 <sup>s</sup>	55 <sup>6</sup> 2 <sup>2</sup>
11	31 <sup>s</sup> 74 <sup>s</sup>	62 <sup>8</sup> 1 <sup>8</sup>	17 <sup>s</sup> 00 <sup>s</sup>	23 <sup>5</sup> 0 <sup>8</sup>	48 <sup>s</sup> 31 <sup>s</sup>	53 <sup>4</sup> 2 <sup>0</sup>
21	32 <sup>s</sup> 06 <sup>s</sup>	61 <sup>0</sup> 1 <sup>4</sup>	17 <sup>s</sup> 54 <sup>s</sup>	24 <sup>8</sup> 1 <sup>3</sup>	48 <sup>s</sup> 64 <sup>s</sup>	51 <sup>4</sup> 1 <sup>6</sup>
31	32 <sup>s</sup> 38 <sup>s</sup>	59 <sup>6</sup> 1 <sup>0</sup>	18 <sup>s</sup> 07 <sup>s</sup>	26 <sup>5</sup> 1 <sup>7</sup>	48 <sup>s</sup> 95 <sup>s</sup>	49 <sup>8</sup> 1 <sup>1</sup>
Feb. 10	32 <sup>s</sup> 68 <sup>s</sup>	58 <sup>6</sup> 0 <sup>6</sup>	18 <sup>s</sup> 57 <sup>s</sup>	28 <sup>6</sup> 2 <sup>5</sup>	49 <sup>s</sup> 26 <sup>s</sup>	48 <sup>7</sup> 0 <sup>7</sup>
20	32 <sup>s</sup> 95 <sup>s</sup>	58 <sup>0</sup> 0 <sup>2</sup>	19 <sup>s</sup> 03 <sup>s</sup>	31 <sup>1</sup> 2 <sup>7</sup>	49 <sup>s</sup> 54 <sup>s</sup>	48 <sup>0</sup> 0 <sup>3</sup>
Mar. 2	33 <sup>s</sup> 19 <sup>s</sup>	57 <sup>8</sup> 0 <sup>2</sup>	19 <sup>s</sup> 44 <sup>s</sup>	33 <sup>8</sup> 2 <sup>8</sup>	49 <sup>s</sup> 79 <sup>s</sup>	47 <sup>7</sup> 0 <sup>2</sup>
12	33 <sup>s</sup> 40 <sup>s</sup>	58 <sup>0</sup> 0 <sup>6</sup>	19 <sup>s</sup> 80 <sup>s</sup>	36 <sup>6</sup> 3 <sup>0</sup>	50 <sup>s</sup> 01 <sup>s</sup>	47 <sup>9</sup> 0 <sup>5</sup>
22	33 <sup>s</sup> 57 <sup>s</sup>	58 <sup>6</sup> 0 <sup>9</sup>	20 <sup>s</sup> 10 <sup>s</sup>	39 <sup>6</sup> 3 <sup>0</sup>	50 <sup>s</sup> 20 <sup>s</sup>	48 <sup>4</sup> 0 <sup>9</sup>
Apr. 1	33 <sup>s</sup> 70 <sup>s</sup>	59 <sup>5</sup> 1 <sup>2</sup>	20 <sup>s</sup> 34 <sup>s</sup>	42 <sup>6</sup> 3 <sup>0</sup>	50 <sup>s</sup> 35 <sup>s</sup>	49 <sup>3</sup> 1 <sup>2</sup>
11	33 <sup>s</sup> 80 <sup>s</sup>	60 <sup>7</sup> 1 <sup>4</sup>	20 <sup>s</sup> 52 <sup>s</sup>	45 <sup>6</sup> 2 <sup>9</sup>	50 <sup>s</sup> 47 <sup>s</sup>	50 <sup>5</sup> 1 <sup>4</sup>
21	33 <sup>s</sup> 86 <sup>s</sup>	62 <sup>1</sup> 1 <sup>5</sup>	20 <sup>s</sup> 64 <sup>s</sup>	48 <sup>5</sup> 2 <sup>8</sup>	50 <sup>s</sup> 55 <sup>s</sup>	51 <sup>9</sup> 1 <sup>5</sup>
May 1	33 <sup>s</sup> 90 <sup>s</sup>	63 <sup>6</sup> 1 <sup>6</sup>	20 <sup>s</sup> 70 <sup>s</sup>	51 <sup>3</sup> 2 <sup>6</sup>	50 <sup>s</sup> 60 <sup>s</sup>	53 <sup>4</sup> 1 <sup>6</sup>
11	33 <sup>s</sup> 90 <sup>s</sup>	65 <sup>2</sup> 1 <sup>5</sup>	20 <sup>s</sup> 70 <sup>s</sup>	53 <sup>9</sup> 2 <sup>4</sup>	50 <sup>s</sup> 62 <sup>s</sup>	55 <sup>0</sup> 1 <sup>6</sup>
21	33 <sup>s</sup> 88 <sup>s</sup>	66 <sup>7</sup> 1 <sup>5</sup>	20 <sup>s</sup> 65 <sup>s</sup>	56 <sup>3</sup> 2 <sup>1</sup>	50 <sup>s</sup> 62 <sup>s</sup>	56 <sup>6</sup> 1 <sup>6</sup>
31	33 <sup>s</sup> 83 <sup>s</sup>	68 <sup>2</sup> 1 <sup>4</sup>	20 <sup>s</sup> 54 <sup>s</sup>	58 <sup>4</sup> 1 <sup>8</sup>	50 <sup>s</sup> 58 <sup>s</sup>	58 <sup>2</sup> 1 <sup>4</sup>
June 10	33 <sup>s</sup> 76 <sup>s</sup>	69 <sup>6</sup> 1 <sup>2</sup>	20 <sup>s</sup> 39 <sup>s</sup>	60 <sup>2</sup> 1 <sup>5</sup>	50 <sup>s</sup> 52 <sup>s</sup>	59 <sup>6</sup> 1 <sup>3</sup>
20	33 <sup>s</sup> 67 <sup>s</sup>	70 <sup>8</sup> 1 <sup>0</sup>	20 <sup>s</sup> 18 <sup>s</sup>	61 <sup>7</sup> 1 <sup>0</sup>	50 <sup>s</sup> 44 <sup>s</sup>	60 <sup>9</sup> 1 <sup>1</sup>
30	33 <sup>s</sup> 57 <sup>s</sup>	71 <sup>8</sup> 0 <sup>8</sup>	19 <sup>s</sup> 94 <sup>s</sup>	62 <sup>7</sup> 0 <sup>6</sup>	50 <sup>s</sup> 34 <sup>s</sup>	62 <sup>0</sup> 0 <sup>9</sup>
July 10	33 <sup>s</sup> 45 <sup>s</sup>	72 <sup>6</sup> 0 <sup>6</sup>	19 <sup>s</sup> 66 <sup>s</sup>	63 <sup>3</sup> 0 <sup>2</sup>	50 <sup>s</sup> 22 <sup>s</sup>	62 <sup>9</sup> 0 <sup>6</sup>
20	33 <sup>s</sup> 32 <sup>s</sup>	73 <sup>2</sup> 0 <sup>3</sup>	19 <sup>s</sup> 36 <sup>s</sup>	63 <sup>5</sup> 0 <sup>3</sup>	50 <sup>s</sup> 09 <sup>s</sup>	63 <sup>5</sup> 0 <sup>4</sup>
30	33 <sup>s</sup> 18 <sup>s</sup>	73 <sup>5</sup> 0 <sup>0</sup>	19 <sup>s</sup> 04 <sup>s</sup>	63 <sup>2</sup> 0 <sup>7</sup>	49 <sup>s</sup> 95 <sup>s</sup>	63 <sup>9</sup> 0 <sup>2</sup>
Aug. 9	33 <sup>s</sup> 04 <sup>s</sup>	73 <sup>5</sup> 0 <sup>5</sup>	18 <sup>s</sup> 71 <sup>s</sup>	62 <sup>5</sup> 1 <sup>1</sup>	49 <sup>s</sup> 80 <sup>s</sup>	63 <sup>8</sup> 0 <sup>5</sup>
19	32 <sup>s</sup> 91 <sup>s</sup>	73 <sup>3</sup> 0 <sup>8</sup>	18 <sup>s</sup> 39 <sup>s</sup>	61 <sup>4</sup> 1 <sup>5</sup>	49 <sup>s</sup> 65 <sup>s</sup>	62 <sup>5</sup> 0 <sup>0</sup>
29	32 <sup>s</sup> 78 <sup>s</sup>	72 <sup>8</sup> 0 <sup>8</sup>	18 <sup>s</sup> 09 <sup>s</sup>	59 <sup>9</sup> 1 <sup>8</sup>	49 <sup>s</sup> 50 <sup>s</sup>	63 <sup>3</sup> 0 <sup>0</sup>
Sept. 8	32 <sup>s</sup> 67 <sup>s</sup>	72 <sup>0</sup> 1 <sup>1</sup>	17 <sup>s</sup> 82 <sup>s</sup>	58 <sup>1</sup> 2 <sup>2</sup>	49 <sup>s</sup> 37 <sup>s</sup>	62 <sup>5</sup> 0 <sup>0</sup>
18	32 <sup>s</sup> 58 <sup>s</sup>	70 <sup>9</sup> 1 <sup>3</sup>	17 <sup>s</sup> 60 <sup>s</sup>	55 <sup>9</sup> 2 <sup>3</sup>	49 <sup>s</sup> 26 <sup>s</sup>	61 <sup>0</sup>
28	32 <sup>s</sup> 52 <sup>s</sup>	69 <sup>6</sup> 1 <sup>7</sup>	17 <sup>s</sup> 45 <sup>s</sup>	53 <sup>6</sup> 2 <sup>4</sup>	49 <sup>s</sup> 18 <sup>s</sup>	
Oct. 8	32 <sup>s</sup> 51 <sup>s</sup>	67 <sup>9</sup> 1 <sup>9</sup>	17 <sup>s</sup> 37 <sup>s</sup>	51 <sup>2</sup> 2 <sup>4</sup>	49 <sup>s</sup> 13 <sup>s</sup>	
18	32 <sup>s</sup> 51 <sup>s</sup>	66 <sup>0</sup> 2 <sup>3</sup>	17 <sup>s</sup> 38 <sup>s</sup>	48 <sup>8</sup> 2 <sup>5</sup>	49 <sup>s</sup> 12 <sup>s</sup>	
28	32 <sup>s</sup> 58 <sup>s</sup>	63 <sup>7</sup> 2 <sup>4</sup>	17 <sup>s</sup> 48 <sup>s</sup>	46 <sup>3</sup> 2 <sup>1</sup>	49 <sup>s</sup> 16 <sup>s</sup>	
Nov. 7	32 <sup>s</sup> 69 <sup>s</sup>	61 <sup>3</sup> 2 <sup>5</sup>	17 <sup>s</sup> 67 <sup>s</sup>	44 <sup>2</sup> 1 <sup>8</sup>	49 <sup>s</sup> 25 <sup>s</sup>	
17	32 <sup>s</sup> 85 <sup>s</sup>	58 <sup>8</sup> 2 <sup>6</sup>	17 <sup>s</sup> 95 <sup>s</sup>	42 <sup>4</sup> 1 <sup>3</sup>	49 <sup>s</sup> 39 <sup>s</sup>	
27	33 <sup>s</sup> 06 <sup>s</sup>	56 <sup>2</sup> 2 <sup>7</sup>	18 <sup>s</sup> 31 <sup>s</sup>	41 <sup>1</sup> 1 <sup>0</sup>	49 <sup>s</sup> 37 <sup>s</sup>	
Dec. 7	33 <sup>s</sup> 31 <sup>s</sup>	53 <sup>5</sup> 2 <sup>6</sup>	18 <sup>s</sup> 73 <sup>s</sup>	40 <sup>1</sup> 0 <sup>4</sup>	49 <sup>s</sup> 27 <sup>s</sup>	
17	33 <sup>s</sup> 60 <sup>s</sup>	50 <sup>9</sup> 2 <sup>5</sup>	19 <sup>s</sup> 21 <sup>s</sup>	39 <sup>7</sup> 0 <sup>0</sup>	50 <sup>s</sup> 1 <sup>s</sup>	
27	33 <sup>s</sup> 91 <sup>s</sup>	48 <sup>4</sup> 2 <sup>2</sup>	19 <sup>s</sup> 74 <sup>s</sup>	39 <sup>7</sup> 0 <sup>6</sup>	50 <sup>s</sup>	
37	34 <sup>s</sup> 23 <sup>s</sup>	46 <sup>2</sup> 2 <sup>2</sup>	20 <sup>s</sup> 29 <sup>s</sup>	40 <sup>3</sup> 0 <sup>6</sup>		



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha^2$ Centauri.				$\epsilon$ Bootis.				$\alpha^2$ LIBRÆ.			
	R. A.		Dec. South.		R. A.		Dec. North.		R. A.		Dec. South.	
	<sup>h</sup> 14	<sup>m</sup> 29	<sup>o</sup> 60	<sup>i</sup> 12	<sup>h</sup> 14	<sup>m</sup> 38	<sup>o</sup> 27	<sup>i</sup> 42	<sup>h</sup> 14	<sup>m</sup> 42	<sup>o</sup> 15	<sup>i</sup> 24
Jan. 1	26 <sup>s</sup> 49 <sup>a</sup>		15 <sup>o</sup> 0 <sup>i</sup>		24 <sup>s</sup> 69 <sup>a</sup>		31 <sup>o</sup> 2 <sup>i</sup>		34 <sup>s</sup> 07 <sup>a</sup>		43 <sup>o</sup> 5 <sup>i</sup>	
11	27 <sup>03</sup>	0 <sup>54</sup>	15 <sup>3</sup>	0 <sup>3</sup>	25 <sup>00</sup>	0 <sup>31</sup>	28 <sup>8</sup>	2 <sup>4</sup>	34 <sup>39</sup>	0 <sup>32</sup>	45 <sup>0</sup>	1 <sup>3</sup>
21	27 <sup>58</sup>	0 <sup>55</sup>	16 <sup>1</sup>	0 <sup>8</sup>	25 <sup>33</sup>	0 <sup>33</sup>	26 <sup>8</sup>	2 <sup>0</sup>	34 <sup>71</sup>	0 <sup>32</sup>	46 <sup>7</sup>	1 <sup>7</sup>
31	28 <sup>12</sup>	0 <sup>54</sup>	17 <sup>3</sup>	1 <sup>2</sup>	25 <sup>67</sup>	0 <sup>34</sup>	25 <sup>2</sup>	1 <sup>6</sup>	35 <sup>04</sup>	0 <sup>33</sup>	48 <sup>4</sup>	1 <sup>7</sup>
		0 <sup>53</sup>		1 <sup>7</sup>		0 <sup>32</sup>		1 <sup>1</sup>		0 <sup>31</sup>		1 <sup>6</sup>
Feb. 10	28 <sup>65</sup>		19 <sup>0</sup>		25 <sup>99</sup>		24 <sup>1</sup>		35 <sup>35</sup>		50 <sup>0</sup>	
20	29 <sup>14</sup>	0 <sup>49</sup>	20 <sup>9</sup>	1 <sup>9</sup>	26 <sup>30</sup>	0 <sup>31</sup>	23 <sup>5</sup>	0 <sup>6</sup>	35 <sup>64</sup>	0 <sup>29</sup>	51 <sup>5</sup>	1 <sup>5</sup>
Mar. 2	29 <sup>60</sup>	0 <sup>46</sup>	23 <sup>2</sup>	2 <sup>3</sup>	26 <sup>59</sup>	0 <sup>29</sup>	23 <sup>4</sup>	0 <sup>1</sup>	35 <sup>92</sup>	0 <sup>28</sup>	52 <sup>9</sup>	1 <sup>4</sup>
12	30 <sup>01</sup>	0 <sup>41</sup>	25 <sup>7</sup>	2 <sup>5</sup>	26 <sup>84</sup>	0 <sup>25</sup>	23 <sup>8</sup>	0 <sup>4</sup>	36 <sup>16</sup>	0 <sup>24</sup>	54 <sup>1</sup>	1 <sup>2</sup>
		0 <sup>35</sup>		2 <sup>6</sup>		0 <sup>22</sup>		0 <sup>9</sup>		0 <sup>22</sup>		1 <sup>0</sup>
22	30 <sup>36</sup>		28 <sup>3</sup>		27 <sup>06</sup>		24 <sup>7</sup>		36 <sup>38</sup>		55 <sup>1</sup>	
Apr. 1	30 <sup>66</sup>	0 <sup>30</sup>	31 <sup>1</sup>	2 <sup>8</sup>	27 <sup>25</sup>	0 <sup>19</sup>	25 <sup>9</sup>	1 <sup>2</sup>	36 <sup>57</sup>	0 <sup>19</sup>	56 <sup>0</sup>	0 <sup>8</sup>
11	30 <sup>91</sup>	0 <sup>25</sup>	33 <sup>9</sup>	2 <sup>8</sup>	27 <sup>40</sup>	0 <sup>15</sup>	27 <sup>5</sup>	1 <sup>6</sup>	36 <sup>73</sup>	0 <sup>16</sup>	56 <sup>7</sup>	0 <sup>7</sup>
21	31 <sup>09</sup>	0 <sup>18</sup>	36 <sup>7</sup>	2 <sup>8</sup>	27 <sup>52</sup>	0 <sup>12</sup>	29 <sup>3</sup>	1 <sup>8</sup>	36 <sup>86</sup>	0 <sup>13</sup>	57 <sup>2</sup>	0 <sup>5</sup>
		0 <sup>13</sup>		2 <sup>8</sup>		0 <sup>08</sup>		2 <sup>0</sup>		0 <sup>11</sup>		0 <sup>3</sup>
May 1	31 <sup>22</sup>		39 <sup>5</sup>		27 <sup>60</sup>		31 <sup>3</sup>		36 <sup>97</sup>		57 <sup>5</sup>	
11	31 <sup>28</sup>	0 <sup>06</sup>	42 <sup>1</sup>	2 <sup>6</sup>	27 <sup>64</sup>	0 <sup>04</sup>	33 <sup>4</sup>	2 <sup>1</sup>	37 <sup>04</sup>	0 <sup>07</sup>	57 <sup>8</sup>	0 <sup>3</sup>
21	31 <sup>28</sup>	0 <sup>00</sup>	44 <sup>6</sup>	2 <sup>5</sup>	27 <sup>66</sup>	0 <sup>02</sup>	35 <sup>5</sup>	2 <sup>1</sup>	37 <sup>08</sup>	0 <sup>04</sup>	57 <sup>9</sup>	0 <sup>1</sup>
31	31 <sup>23</sup>	0 <sup>05</sup>	46 <sup>9</sup>	2 <sup>3</sup>	27 <sup>64</sup>	0 <sup>02</sup>	37 <sup>5</sup>	2 <sup>0</sup>	37 <sup>10</sup>	0 <sup>02</sup>	57 <sup>9</sup>	0 <sup>0</sup>
		0 <sup>11</sup>		2 <sup>0</sup>		0 <sup>05</sup>		1 <sup>9</sup>		0 <sup>01</sup>		0 <sup>1</sup>
June 10	31 <sup>12</sup>		48 <sup>9</sup>		27 <sup>59</sup>		39 <sup>4</sup>		37 <sup>09</sup>		57 <sup>8</sup>	
20	30 <sup>95</sup>	0 <sup>17</sup>	50 <sup>6</sup>	1 <sup>7</sup>	27 <sup>51</sup>	0 <sup>08</sup>	41 <sup>1</sup>	1 <sup>7</sup>	37 <sup>05</sup>	0 <sup>04</sup>	57 <sup>6</sup>	0 <sup>2</sup>
30	30 <sup>73</sup>	0 <sup>22</sup>	52 <sup>0</sup>	1 <sup>4</sup>	27 <sup>41</sup>	0 <sup>10</sup>	42 <sup>6</sup>	1 <sup>5</sup>	36 <sup>99</sup>	0 <sup>06</sup>	57 <sup>4</sup>	0 <sup>2</sup>
July 10	30 <sup>46</sup>	0 <sup>27</sup>	52 <sup>9</sup>	0 <sup>9</sup>	27 <sup>29</sup>	0 <sup>12</sup>	43 <sup>8</sup>	1 <sup>2</sup>	36 <sup>90</sup>	0 <sup>09</sup>	57 <sup>1</sup>	0 <sup>3</sup>
		0 <sup>30</sup>		0 <sup>6</sup>		0 <sup>14</sup>		0 <sup>8</sup>		0 <sup>11</sup>		0 <sup>4</sup>
20	30 <sup>16</sup>		53 <sup>5</sup>		27 <sup>15</sup>		44 <sup>6</sup>		36 <sup>79</sup>		56 <sup>7</sup>	
30	29 <sup>83</sup>	0 <sup>33</sup>	53 <sup>6</sup>	0 <sup>1</sup>	26 <sup>99</sup>	0 <sup>16</sup>	45 <sup>2</sup>	0 <sup>6</sup>	36 <sup>66</sup>	0 <sup>13</sup>	56 <sup>3</sup>	0 <sup>2</sup>
Aug. 9	29 <sup>48</sup>	0 <sup>35</sup>	53 <sup>3</sup>	0 <sup>3</sup>	26 <sup>82</sup>	0 <sup>17</sup>	45 <sup>4</sup>	0 <sup>2</sup>	36 <sup>52</sup>	0 <sup>14</sup>	55 <sup>8</sup>	0 <sup>5</sup>
19	29 <sup>12</sup>	0 <sup>36</sup>	52 <sup>6</sup>	0 <sup>7</sup>	26 <sup>65</sup>	0 <sup>17</sup>	45 <sup>3</sup>	0 <sup>1</sup>	36 <sup>38</sup>	0 <sup>14</sup>	55 <sup>3</sup>	0 <sup>5</sup>
		0 <sup>35</sup>		1 <sup>2</sup>		0 <sup>17</sup>		0 <sup>5</sup>		0 <sup>15</sup>		0 <sup>5</sup>
29	28 <sup>77</sup>		51 <sup>4</sup>		26 <sup>48</sup>		44 <sup>8</sup>		36 <sup>23</sup>		54 <sup>8</sup>	
Sept. 8	28 <sup>45</sup>	0 <sup>32</sup>	49 <sup>9</sup>	1 <sup>5</sup>	26 <sup>31</sup>	0 <sup>17</sup>	43 <sup>9</sup>	0 <sup>9</sup>	36 <sup>09</sup>	0 <sup>14</sup>	54 <sup>3</sup>	0 <sup>5</sup>
18	28 <sup>17</sup>	0 <sup>28</sup>	48 <sup>0</sup>	1 <sup>9</sup>	26 <sup>17</sup>	0 <sup>14</sup>	42 <sup>7</sup>	1 <sup>2</sup>	35 <sup>96</sup>	0 <sup>13</sup>	53 <sup>8</sup>	0 <sup>5</sup>
28	27 <sup>95</sup>	0 <sup>22</sup>	45 <sup>9</sup>	2 <sup>1</sup>	26 <sup>05</sup>	0 <sup>12</sup>	41 <sup>1</sup>	1 <sup>6</sup>	35 <sup>86</sup>	0 <sup>10</sup>	53 <sup>4</sup>	0 <sup>4</sup>
		0 <sup>16</sup>		2 <sup>3</sup>		0 <sup>09</sup>		1 <sup>8</sup>		0 <sup>07</sup>		0 <sup>3</sup>
Oct. 8	27 <sup>79</sup>		43 <sup>6</sup>		25 <sup>96</sup>		39 <sup>3</sup>		35 <sup>79</sup>		53 <sup>1</sup>	
18	27 <sup>72</sup>	0 <sup>07</sup>	41 <sup>3</sup>	2 <sup>3</sup>	25 <sup>91</sup>	0 <sup>05</sup>	37 <sup>1</sup>	2 <sup>2</sup>	35 <sup>76</sup>	0 <sup>03</sup>	52 <sup>9</sup>	0 <sup>2</sup>
28	27 <sup>74</sup>	0 <sup>02</sup>	38 <sup>9</sup>	2 <sup>4</sup>	25 <sup>91</sup>	0 <sup>00</sup>	34 <sup>6</sup>	2 <sup>5</sup>	35 <sup>78</sup>	0 <sup>02</sup>	53 <sup>0</sup>	0 <sup>1</sup>
Nov. 7	27 <sup>85</sup>	0 <sup>11</sup>	36 <sup>5</sup>	2 <sup>4</sup>	25 <sup>97</sup>	0 <sup>06</sup>	31 <sup>7</sup>	2 <sup>9</sup>	35 <sup>85</sup>	0 <sup>07</sup>	53 <sup>3</sup>	0 <sup>3</sup>
		0 <sup>20</sup>		2 <sup>0</sup>		0 <sup>10</sup>		2 <sup>9</sup>		0 <sup>13</sup>		0 <sup>5</sup>
17	28 <sup>05</sup>		34 <sup>5</sup>		26 <sup>07</sup>		28 <sup>8</sup>		35 <sup>98</sup>		53 <sup>8</sup>	
27	28 <sup>35</sup>	0 <sup>30</sup>	32 <sup>8</sup>	1 <sup>7</sup>	26 <sup>23</sup>	0 <sup>16</sup>	25 <sup>8</sup>	3 <sup>0</sup>	36 <sup>15</sup>	0 <sup>17</sup>	54 <sup>5</sup>	0 <sup>7</sup>
Dec. 7	28 <sup>72</sup>	0 <sup>37</sup>	31 <sup>4</sup>	1 <sup>4</sup>	26 <sup>44</sup>	0 <sup>21</sup>	22 <sup>8</sup>	3 <sup>0</sup>	36 <sup>37</sup>	0 <sup>22</sup>	55 <sup>5</sup>	1 <sup>0</sup>
17	29 <sup>16</sup>	0 <sup>44</sup>	30 <sup>5</sup>	0 <sup>9</sup>	26 <sup>69</sup>	0 <sup>25</sup>	19 <sup>9</sup>	2 <sup>9</sup>	36 <sup>63</sup>	0 <sup>26</sup>	56 <sup>7</sup>	1 <sup>2</sup>
		0 <sup>49</sup>		0 <sup>4</sup>		0 <sup>29</sup>		2 <sup>8</sup>		0 <sup>29</sup>		1 <sup>4</sup>
27	29 <sup>65</sup>		30 <sup>1</sup>		26 <sup>98</sup>		17 <sup>1</sup>		36 <sup>92</sup>		58 <sup>1</sup>	
37	30 <sup>19</sup>	0 <sup>54</sup>	30 <sup>2</sup>	0 <sup>1</sup>	27 <sup>30</sup>	0 <sup>32</sup>	14 <sup>5</sup>	2 <sup>6</sup>	37 <sup>23</sup>	0 <sup>31</sup>	59 <sup>6</sup>	1 <sup>3</sup>



**APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.**

Day of the Month.	$\beta$ URSAE MINORIS.		$\beta$ LIBRAE.		$\alpha$ CORONAE BOREALIS.	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec. North.
	<sup>h</sup> 14 <sup>m</sup> 51	<sup>°</sup> 74 <sup>'</sup> 45	<sup>h</sup> 15 <sup>m</sup> 8	<sup>°</sup> 8 <sup>'</sup> 49	<sup>h</sup> 15 <sup>m</sup> 28	<sup>°</sup> 27 <sup>'</sup> 13
Jan. 1	7 <sup>s</sup> 90	57 <sup>s</sup> 5	55 <sup>s</sup> 05	23 <sup>s</sup> 7	18 <sup>s</sup> 57	21 <sup>s</sup> 6
11	8 <sup>s</sup> 69 0 <sup>m</sup> 79	55 <sup>s</sup> 2 2 <sup>m</sup> 3	55 <sup>s</sup> 34 0 <sup>m</sup> 29	25 <sup>s</sup> 3 1 <sup>m</sup> 6	18 <sup>s</sup> 86 0 <sup>m</sup> 29	19 <sup>s</sup> 0 2 <sup>m</sup> 6
21	9 <sup>s</sup> 55 0 <sup>m</sup> 86	53 <sup>s</sup> 5 1 <sup>m</sup> 7	55 <sup>s</sup> 65 0 <sup>m</sup> 31	27 <sup>s</sup> 0 1 <sup>m</sup> 7	19 <sup>s</sup> 17 0 <sup>m</sup> 31	16 <sup>s</sup> 7 2 <sup>m</sup> 3
31	10 <sup>s</sup> 44 0 <sup>m</sup> 89	52 <sup>s</sup> 5 1 <sup>m</sup> 0	55 <sup>s</sup> 97 0 <sup>m</sup> 32	28 <sup>s</sup> 6 1 <sup>m</sup> 6	19 <sup>s</sup> 49 0 <sup>m</sup> 32	14 <sup>s</sup> 8 1 <sup>m</sup> 9
	0 <sup>m</sup> 91	0 <sup>m</sup> 4	0 <sup>m</sup> 31	1 <sup>m</sup> 5	0 <sup>m</sup> 33	1 <sup>m</sup> 4
Feb. 10	11 <sup>s</sup> 35	52 <sup>s</sup> 1	56 <sup>s</sup> 28	30 <sup>s</sup> 1	19 <sup>s</sup> 82	13 <sup>s</sup> 4
20	12 <sup>s</sup> 23 0 <sup>m</sup> 88	52 <sup>s</sup> 4 0 <sup>m</sup> 3	56 <sup>s</sup> 57 0 <sup>m</sup> 29	31 <sup>s</sup> 4 1 <sup>m</sup> 3	20 <sup>s</sup> 14 0 <sup>m</sup> 32	12 <sup>s</sup> 5 0 <sup>m</sup> 9
Mar. 2	13 <sup>s</sup> 06 0 <sup>m</sup> 83	53 <sup>s</sup> 3 0 <sup>m</sup> 9	56 <sup>s</sup> 85 0 <sup>m</sup> 28	32 <sup>s</sup> 5 1 <sup>m</sup> 1	20 <sup>s</sup> 44 0 <sup>m</sup> 30	12 <sup>s</sup> 1 0 <sup>m</sup> 4
12	13 <sup>s</sup> 81 0 <sup>m</sup> 75	54 <sup>s</sup> 9 1 <sup>m</sup> 6	57 <sup>s</sup> 11 0 <sup>m</sup> 26	33 <sup>s</sup> 4 0 <sup>m</sup> 9	20 <sup>s</sup> 72 0 <sup>m</sup> 28	12 <sup>s</sup> 2 0 <sup>m</sup> 1
	0 <sup>m</sup> 64	2 <sup>m</sup> 0	0 <sup>m</sup> 23	0 <sup>m</sup> 7	0 <sup>m</sup> 26	0 <sup>m</sup> 6
22	14 <sup>s</sup> 45	56 <sup>s</sup> 9	57 <sup>s</sup> 34	34 <sup>s</sup> 1	20 <sup>s</sup> 98	12 <sup>s</sup> 8
Apr. 1	14 <sup>s</sup> 98 0 <sup>m</sup> 53	59 <sup>s</sup> 4 2 <sup>m</sup> 5	57 <sup>s</sup> 55 0 <sup>m</sup> 21	34 <sup>s</sup> 6 0 <sup>m</sup> 5	21 <sup>s</sup> 21 0 <sup>m</sup> 23	13 <sup>s</sup> 8 1 <sup>m</sup> 0
11	15 <sup>s</sup> 36 0 <sup>m</sup> 38	62 <sup>s</sup> 3 2 <sup>m</sup> 9	57 <sup>s</sup> 73 0 <sup>m</sup> 18	34 <sup>s</sup> 8 0 <sup>m</sup> 2	21 <sup>s</sup> 41 0 <sup>m</sup> 20	15 <sup>s</sup> 3 1 <sup>m</sup> 5
21	15 <sup>s</sup> 61 0 <sup>m</sup> 25	65 <sup>s</sup> 4 3 <sup>m</sup> 1	57 <sup>s</sup> 88 0 <sup>m</sup> 15	34 <sup>s</sup> 9 0 <sup>m</sup> 1	21 <sup>s</sup> 57 0 <sup>m</sup> 16	17 <sup>s</sup> 1 1 <sup>m</sup> 8
	0 <sup>m</sup> 10	3 <sup>m</sup> 1	0 <sup>m</sup> 12	0 <sup>m</sup> 1	0 <sup>m</sup> 13	2 <sup>m</sup> 0
May 1	15 <sup>s</sup> 71	68 <sup>s</sup> 5	58 <sup>s</sup> 00	34 <sup>s</sup> 8	21 <sup>s</sup> 70	19 <sup>s</sup> 1
11	15 <sup>s</sup> 67 0 <sup>m</sup> 04	71 <sup>s</sup> 6 3 <sup>m</sup> 1	58 <sup>s</sup> 10 0 <sup>m</sup> 10	34 <sup>s</sup> 6 0 <sup>m</sup> 2	21 <sup>s</sup> 80 0 <sup>m</sup> 10	21 <sup>s</sup> 2 2 <sup>m</sup> 1
21	15 <sup>s</sup> 49 0 <sup>m</sup> 18	74 <sup>s</sup> 6 3 <sup>m</sup> 0	58 <sup>s</sup> 17 0 <sup>m</sup> 07	34 <sup>s</sup> 3 0 <sup>m</sup> 3	21 <sup>s</sup> 87 0 <sup>m</sup> 07	23 <sup>s</sup> 4 2 <sup>m</sup> 2
31	15 <sup>s</sup> 19 0 <sup>m</sup> 30	77 <sup>s</sup> 4 2 <sup>m</sup> 8	58 <sup>s</sup> 21 0 <sup>m</sup> 04	33 <sup>s</sup> 9 0 <sup>m</sup> 4	21 <sup>s</sup> 90 0 <sup>m</sup> 03	25 <sup>s</sup> 6 2 <sup>m</sup> 2
	0 <sup>m</sup> 42	2 <sup>m</sup> 5	0 <sup>m</sup> 01	0 <sup>m</sup> 4	0 <sup>m</sup> 01	2 <sup>m</sup> 1
June 10	14 <sup>s</sup> 77	79 <sup>s</sup> 9	58 <sup>s</sup> 22	33 <sup>s</sup> 5	21 <sup>s</sup> 89	27 <sup>s</sup> 7
20	14 <sup>s</sup> 25 0 <sup>m</sup> 52	82 <sup>s</sup> 0 2 <sup>m</sup> 1	58 <sup>s</sup> 20 0 <sup>m</sup> 02	33 <sup>s</sup> 0 0 <sup>m</sup> 5	21 <sup>s</sup> 85 0 <sup>m</sup> 04	29 <sup>s</sup> 7 2 <sup>m</sup> 0
30	13 <sup>s</sup> 64 0 <sup>m</sup> 61	83 <sup>s</sup> 7 1 <sup>m</sup> 7	58 <sup>s</sup> 15 0 <sup>m</sup> 05	32 <sup>s</sup> 5 0 <sup>m</sup> 5	21 <sup>s</sup> 78 0 <sup>m</sup> 07	31 <sup>s</sup> 5 1 <sup>m</sup> 8
July 10	12 <sup>s</sup> 96 0 <sup>m</sup> 68	84 <sup>s</sup> 9 1 <sup>m</sup> 2	58 <sup>s</sup> 08 0 <sup>m</sup> 07	32 <sup>s</sup> 0 0 <sup>m</sup> 5	21 <sup>s</sup> 68 0 <sup>m</sup> 10	33 <sup>s</sup> 0 1 <sup>m</sup> 5
	0 <sup>m</sup> 73	0 <sup>m</sup> 7	0 <sup>m</sup> 10	0 <sup>m</sup> 5	0 <sup>m</sup> 13	1 <sup>m</sup> 2
20	12 <sup>s</sup> 23	85 <sup>s</sup> 6	57 <sup>s</sup> 98	31 <sup>s</sup> 5	21 <sup>s</sup> 55	34 <sup>s</sup> 2
30	11 <sup>s</sup> 46 0 <sup>m</sup> 77	85 <sup>s</sup> 7 0 <sup>m</sup> 1	57 <sup>s</sup> 86 0 <sup>m</sup> 12	31 <sup>s</sup> 1 0 <sup>m</sup> 4	21 <sup>s</sup> 40 0 <sup>m</sup> 15	35 <sup>s</sup> 1 0 <sup>m</sup> 9
Aug. 9	10 <sup>s</sup> 68 0 <sup>m</sup> 78	85 <sup>s</sup> 4 0 <sup>m</sup> 3	57 <sup>s</sup> 73 0 <sup>m</sup> 13	30 <sup>s</sup> 6 0 <sup>m</sup> 5	21 <sup>s</sup> 23 0 <sup>m</sup> 17	35 <sup>s</sup> 7 0 <sup>m</sup> 6
19	9 <sup>s</sup> 89 0 <sup>m</sup> 79	84 <sup>s</sup> 5 0 <sup>m</sup> 9	57 <sup>s</sup> 58 0 <sup>m</sup> 15	30 <sup>s</sup> 2 0 <sup>m</sup> 4	21 <sup>s</sup> 05 0 <sup>m</sup> 18	35 <sup>s</sup> 9 0 <sup>m</sup> 2
	0 <sup>m</sup> 76	1 <sup>m</sup> 4	0 <sup>m</sup> 15	0 <sup>m</sup> 3	0 <sup>m</sup> 19	0 <sup>m</sup> 1
29	9 <sup>s</sup> 13	83 <sup>s</sup> 1	57 <sup>s</sup> 43	29 <sup>s</sup> 9	20 <sup>s</sup> 86	35 <sup>s</sup> 8
Sept. 8	8 <sup>s</sup> 40 0 <sup>m</sup> 73	81 <sup>s</sup> 2 1 <sup>m</sup> 9	57 <sup>s</sup> 28 0 <sup>m</sup> 15	29 <sup>s</sup> 6 0 <sup>m</sup> 3	20 <sup>s</sup> 67 0 <sup>m</sup> 19	35 <sup>s</sup> 3 0 <sup>m</sup> 5
18	7 <sup>s</sup> 74 0 <sup>m</sup> 66	78 <sup>s</sup> 9 2 <sup>m</sup> 3	57 <sup>s</sup> 14 0 <sup>m</sup> 14	29 <sup>s</sup> 4 0 <sup>m</sup> 2	20 <sup>s</sup> 49 0 <sup>m</sup> 18	34 <sup>s</sup> 4 0 <sup>m</sup> 9
28	7 <sup>s</sup> 15 0 <sup>m</sup> 59	76 <sup>s</sup> 1 2 <sup>m</sup> 8	57 <sup>s</sup> 02 0 <sup>m</sup> 12	29 <sup>s</sup> 3 0 <sup>m</sup> 1	20 <sup>s</sup> 33 0 <sup>m</sup> 16	3
	0 <sup>m</sup> 50	3 <sup>m</sup> 1	0 <sup>m</sup> 09	0 <sup>m</sup> 1	0 <sup>m</sup> 13	
Oct. 8	6 <sup>s</sup> 65	73 <sup>s</sup> 0	56 <sup>s</sup> 93	29 <sup>s</sup> 4	20 <sup>s</sup> 20	
18	6 <sup>s</sup> 27 0 <sup>m</sup> 38	69 <sup>s</sup> 6 3 <sup>m</sup> 4	56 <sup>s</sup> 88 0 <sup>m</sup> 05	29 <sup>s</sup> 6 0 <sup>m</sup> 2	20 <sup>s</sup>	
28	6 <sup>s</sup> 02 0 <sup>m</sup> 25	65 <sup>s</sup> 9 3 <sup>m</sup> 7	56 <sup>s</sup> 87 0 <sup>m</sup> 01	30 <sup>s</sup> 0 0 <sup>m</sup> 4	20 <sup>s</sup>	
Nov. 7	5 <sup>s</sup> 91 0 <sup>m</sup> 11	61 <sup>s</sup> 7 4 <sup>m</sup> 2	56 <sup>s</sup> 91 0 <sup>m</sup> 04	30 <sup>s</sup> 6 0 <sup>m</sup> 6	20 <sup>s</sup>	
	0 <sup>m</sup> 05	3 <sup>m</sup> 8	0 <sup>m</sup> 10	0 <sup>m</sup> 9		
17	5 <sup>s</sup> 96	57 <sup>s</sup> 9	57 <sup>s</sup> 01	31 <sup>s</sup> 5		
27	6 <sup>s</sup> 17 0 <sup>m</sup> 21	54 <sup>s</sup> 1 3 <sup>m</sup> 8	57 <sup>s</sup> 15 0 <sup>m</sup> 14	32 <sup>s</sup> 6 1 <sup>m</sup> 1		
Dec. 7	6 <sup>s</sup> 53 0 <sup>m</sup> 36	50 <sup>s</sup> 4 3 <sup>m</sup> 7	57 <sup>s</sup> 34 0 <sup>m</sup> 19	33 <sup>s</sup> 9 1 <sup>m</sup> 3		
17	7 <sup>s</sup> 03 0 <sup>m</sup> 50	47 <sup>s</sup> 0 3 <sup>m</sup> 4	57 <sup>s</sup> 57 0 <sup>m</sup> 23	35 <sup>s</sup> 3 1 <sup>m</sup> 4		
	0 <sup>m</sup> 63	3 <sup>m</sup> 1	0 <sup>m</sup> 26	1 <sup>m</sup> 6		
27	7 <sup>s</sup> 66	43 <sup>s</sup> 9	57 <sup>s</sup> 83	36 <sup>s</sup> 9		
37	8 <sup>s</sup> 41 0 <sup>m</sup> 75	41 <sup>s</sup> 3 2 <sup>m</sup> 6	58 <sup>s</sup> 12 0 <sup>m</sup> 29	38 <sup>s</sup> 5 1 <sup>m</sup> 6		



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ SERPENTIS.			$\zeta$ Ursæ Minoris.			$\beta^1$ Scorpii.		
	R. A.		Dec. North.	R. A.		Dec. North.	R. A.		Dec. So.
	<sup>h</sup> 15	<sup>m</sup> 36	<sup>o</sup> 6 <sup>i</sup> 53	<sup>h</sup> 15	<sup>m</sup> 49	<sup>o</sup> 78 <sup>i</sup> 14	<sup>h</sup> 15	<sup>m</sup> 56	<sup>o</sup> 19 <sup>i</sup> 2
Jan. 1	51° 36'	0° 28'	69° 1'	25° 96'	0° 79'	67° 1'	41° 66'	13° 7'	
11	51° 64'	0° 29'	67° 1'	26° 75'	0° 94'	64° 3'	41° 95'	14° 8'	
21	51° 93'	0° 31'	65° 1'	27° 69'	1° 04'	62° 0'	42° 25'	15° 9'	
31	52° 24'	0° 30'	63° 3'	28° 73'	1° 10'	60° 2'	42° 57'	17° 0'	
Feb. 10	52° 54'	0° 30'	61° 9'	29° 83'	1° 14'	59° 1'	42° 89'	18° 2'	
20	52° 84'	0° 28'	60° 7'	30° 97'	1° 11'	58° 7'	43° 21'	19° 4'	
Mar. 2	53° 12'	0° 26'	59° 9'	32° 08'	1° 06'	58° 9'	43° 51'	20° 4'	
12	53° 38'	0° 25'	59° 5'	33° 14'	0° 97'	59° 8'	43° 81'	21° 4'	
22	53° 63'	0° 22'	59° 4'	34° 11'	0° 85'	61° 2'	44° 09'	22° 3'	
Apr. 1	53° 85'	0° 20'	59° 7'	34° 96'	0° 71'	63° 2'	44° 34'	23° 0'	
11	54° 05'	0° 17'	60° 2'	35° 67'	0° 54'	65° 7'	44° 57'	23° 6'	
21	54° 22'	0° 14'	61° 0'	36° 21'	0° 36'	68° 5'	44° 78'	24° 0'	
May 1	54° 36'	0° 12'	62° 0'	36° 57'	0° 17'	71° 5'	44° 95'	24° 4'	
11	54° 48'	0° 09'	63° 2'	36° 74'	0° 01'	74° 7'	45° 10'	24° 7'	
21	54° 57'	0° 05'	64° 5'	36° 73'	0° 19'	77° 8'	45° 23'	24° 9'	
31	54° 62'	0° 02'	65° 8'	36° 54'	0° 37'	80° 9'	45° 32'	25° 0'	
June 10	54° 64'	0° 00'	67° 1'	36° 17'	0° 52'	83° 8'	45° 37'	25° 1'	
20	54° 64'	0° 04'	68° 3'	35° 65'	0° 67'	86° 4'	45° 40'	25° 1'	
30	54° 60'	0° 06'	69° 5'	34° 98'	0° 80'	88° 7'	45° 38'	25° 1'	
July 10	54° 54'	0° 09'	70° 5'	34° 18'	0° 91'	90° 5'	45° 34'	25° 0'	
20	54° 45'	0° 12'	71° 4'	33° 27'	0° 99'	92° 0'	45° 26'	24° 9'	
30	54° 33'	0° 14'	72° 2'	32° 28'	1° 05'	92° 9'	45° 15'	24° 8'	
Aug. 9	54° 19'	0° 15'	72° 7'	31° 23'	1° 09'	93° 3'	45° 02'	24° 6'	
19	54° 04'	0° 16'	73° 1'	30° 14'	1° 10'	93° 2'	44° 86'	24° 4'	
29	53° 88'	0° 16'	73° 3'	29° 04'	1° 09'	92° 6'	44° 69'	24° 1'	
Sept. 8	53° 72'	0° 15'	73° 3'	27° 95'	1° 05'	91° 5'	44° 52'	23° 7'	
18	53° 57'	0° 14'	73° 0'	26° 90'	0° 98'	89° 9'	44° 36'	23° 4'	
28	53° 43'	0° 12'	72° 5'	25° 92'	0° 89'	87° 8'	44° 21'	23° 0'	
Oct. 8	53° 31'	0° 08'	71° 8'	25° 03'	0° 77'	85° 3'	44° 08'	22° 7'	
18	53° 23'	0° 04'	70° 8'	24° 26'	0° 63'	82° 4'	43° 98'	22° 4'	
28	53° 19'	0° 00'	69° 6'	23° 63'	0° 46'	79° 2'	43° 93'	22° 2'	
Nov. 7	53° 19'	0° 06'	68° 1'	23° 17'	0° 27'	75° 7'	43° 92'	22° 1'	
17	53° 25'	0° 11'	66° 2'	22° 90'	0° 08'	72° 0'	43° 97'	22° 2'	
27	53° 36'	0° 15'	64° 3'	22° 82'	0° 14'	67° 9'	44° 08'	22° 5'	
Dec. 7	53° 51'	0° 20'	62° 2'	22° 96'	0° 35'	64° 1'	44° 23'	23° 0'	
17	53° 71'	0° 23'	60° 0'	23° 31'	0° 54'	60° 4'	44° 43'	23° 7'	
27	53° 94'	0° 27'	57° 8'	23° 85'	0° 71'	57° 0'	44° 68'	24° 5'	
37	54° 21'	0° 27'	55° 7'	24° 56'	0° 71'	54° 0'	44° 95'	25° 5'	



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	♄ OPHIUCHI.			♏ SCORPIL. (Antares)			♁ Draconis.		
	R. A.		Dec. South.	R. A.		Dec. South.	R. A.		Dec. North.
	<sup>h</sup> 16	<sup>m</sup> 6	<sup>o</sup> 3 <sup>'</sup> 18	<sup>h</sup> 16 <sup>m</sup> 20	<sup>o</sup> 26 <sup>'</sup> 5		<sup>h</sup> 16 <sup>m</sup> 21	<sup>o</sup> 61 <sup>'</sup> 51	
Jan. 1	27 <sup>s</sup> 66 <sup>s</sup>	0 <sup>s</sup> 26 <sup>s</sup>	6 <sup>s</sup> 7 <sup>s</sup>	11 <sup>s</sup> 24 <sup>s</sup>	25 <sup>s</sup> 9 <sup>s</sup>		55 <sup>s</sup> 51 <sup>s</sup>	14 <sup>s</sup> 5 <sup>s</sup>	
11	27 <sup>s</sup> 92 <sup>s</sup>	0 <sup>s</sup> 28 <sup>s</sup>	8 <sup>s</sup> 4 <sup>s</sup>	11 <sup>s</sup> 53 <sup>s</sup>	26 <sup>s</sup> 5 <sup>s</sup>		55 <sup>s</sup> 86 <sup>s</sup>	11 <sup>s</sup> 3 <sup>s</sup>	
21	28 <sup>s</sup> 20 <sup>s</sup>	0 <sup>s</sup> 30 <sup>s</sup>	10 <sup>s</sup> 1 <sup>s</sup>	11 <sup>s</sup> 84 <sup>s</sup>	27 <sup>s</sup> 2 <sup>s</sup>		56 <sup>s</sup> 28 <sup>s</sup>	8 <sup>s</sup> 5 <sup>s</sup>	
31	28 <sup>s</sup> 50 <sup>s</sup>	0 <sup>s</sup> 30 <sup>s</sup>	11 <sup>s</sup> 6 <sup>s</sup>	12 <sup>s</sup> 16 <sup>s</sup>	28 <sup>s</sup> 0 <sup>s</sup>		56 <sup>s</sup> 74 <sup>s</sup>	6 <sup>s</sup> 2 <sup>s</sup>	
		0 <sup>s</sup> 30 <sup>s</sup>	1 <sup>s</sup> 4 <sup>s</sup>		0 <sup>s</sup> 33 <sup>s</sup>			0 <sup>s</sup> 50 <sup>s</sup>	1 <sup>s</sup> 7 <sup>s</sup>
Feb. 10	28 <sup>s</sup> 80 <sup>s</sup>	0 <sup>s</sup> 30 <sup>s</sup>	13 <sup>s</sup> 0 <sup>s</sup>	12 <sup>s</sup> 49 <sup>s</sup>	28 <sup>s</sup> 9 <sup>s</sup>		57 <sup>s</sup> 24 <sup>s</sup>	4 <sup>s</sup> 5 <sup>s</sup>	
20	29 <sup>s</sup> 10 <sup>s</sup>	0 <sup>s</sup> 29 <sup>s</sup>	14 <sup>s</sup> 1 <sup>s</sup>	12 <sup>s</sup> 82 <sup>s</sup>	29 <sup>s</sup> 8 <sup>s</sup>		57 <sup>s</sup> 76 <sup>s</sup>	3 <sup>s</sup> 5 <sup>s</sup>	
Mar. 2	29 <sup>s</sup> 39 <sup>s</sup>	0 <sup>s</sup> 28 <sup>s</sup>	15 <sup>s</sup> 1 <sup>s</sup>	13 <sup>s</sup> 15 <sup>s</sup>	30 <sup>s</sup> 7 <sup>s</sup>		58 <sup>s</sup> 28 <sup>s</sup>	3 <sup>s</sup> 1 <sup>s</sup>	
12	29 <sup>s</sup> 67 <sup>s</sup>	0 <sup>s</sup> 26 <sup>s</sup>	15 <sup>s</sup> 7 <sup>s</sup>	13 <sup>s</sup> 46 <sup>s</sup>	31 <sup>s</sup> 6 <sup>s</sup>		58 <sup>s</sup> 79 <sup>s</sup>	3 <sup>s</sup> 4 <sup>s</sup>	
		0 <sup>s</sup> 26 <sup>s</sup>	0 <sup>s</sup> 4 <sup>s</sup>		0 <sup>s</sup> 30 <sup>s</sup>			0 <sup>s</sup> 48 <sup>s</sup>	0 <sup>s</sup> 9 <sup>s</sup>
22	29 <sup>s</sup> 93 <sup>s</sup>	0 <sup>s</sup> 24 <sup>s</sup>	16 <sup>s</sup> 1 <sup>s</sup>	13 <sup>s</sup> 76 <sup>s</sup>	32 <sup>s</sup> 5 <sup>s</sup>		59 <sup>s</sup> 27 <sup>s</sup>	4 <sup>s</sup> 3 <sup>s</sup>	
Apr. 1	30 <sup>s</sup> 17 <sup>s</sup>	0 <sup>s</sup> 22 <sup>s</sup>	16 <sup>s</sup> 2 <sup>s</sup>	14 <sup>s</sup> 05 <sup>s</sup>	33 <sup>s</sup> 3 <sup>s</sup>		59 <sup>s</sup> 71 <sup>s</sup>	5 <sup>s</sup> 8 <sup>s</sup>	
11	30 <sup>s</sup> 39 <sup>s</sup>	0 <sup>s</sup> 20 <sup>s</sup>	16 <sup>s</sup> 1 <sup>s</sup>	14 <sup>s</sup> 31 <sup>s</sup>	34 <sup>s</sup> 0 <sup>s</sup>		60 <sup>s</sup> 09 <sup>s</sup>	7 <sup>s</sup> 9 <sup>s</sup>	
21	30 <sup>s</sup> 59 <sup>s</sup>	0 <sup>s</sup> 18 <sup>s</sup>	15 <sup>s</sup> 7 <sup>s</sup>	14 <sup>s</sup> 54 <sup>s</sup>	34 <sup>s</sup> 7 <sup>s</sup>		60 <sup>s</sup> 42 <sup>s</sup>	10 <sup>s</sup> 3 <sup>s</sup>	
		0 <sup>s</sup> 18 <sup>s</sup>	0 <sup>s</sup> 5 <sup>s</sup>		0 <sup>s</sup> 21 <sup>s</sup>			0 <sup>s</sup> 25 <sup>s</sup>	2 <sup>s</sup> 9 <sup>s</sup>
May 1	30 <sup>s</sup> 77 <sup>s</sup>	0 <sup>s</sup> 15 <sup>s</sup>	15 <sup>s</sup> 2 <sup>s</sup>	14 <sup>s</sup> 75 <sup>s</sup>	35 <sup>s</sup> 3 <sup>s</sup>		60 <sup>s</sup> 67 <sup>s</sup>	13 <sup>s</sup> 2 <sup>s</sup>	
11	30 <sup>s</sup> 92 <sup>s</sup>	0 <sup>s</sup> 11 <sup>s</sup>	14 <sup>s</sup> 5 <sup>s</sup>	14 <sup>s</sup> 94 <sup>s</sup>	35 <sup>s</sup> 9 <sup>s</sup>		60 <sup>s</sup> 86 <sup>s</sup>	16 <sup>s</sup> 2 <sup>s</sup>	
21	31 <sup>s</sup> 03 <sup>s</sup>	0 <sup>s</sup> 09 <sup>s</sup>	13 <sup>s</sup> 7 <sup>s</sup>	15 <sup>s</sup> 09 <sup>s</sup>	36 <sup>s</sup> 4 <sup>s</sup>		60 <sup>s</sup> 97 <sup>s</sup>	19 <sup>s</sup> 4 <sup>s</sup>	
31	31 <sup>s</sup> 12 <sup>s</sup>	0 <sup>s</sup> 06 <sup>s</sup>	12 <sup>s</sup> 9 <sup>s</sup>	15 <sup>s</sup> 21 <sup>s</sup>	36 <sup>s</sup> 8 <sup>s</sup>		61 <sup>s</sup> 01 <sup>s</sup>	22 <sup>s</sup> 6 <sup>s</sup>	
		0 <sup>s</sup> 06 <sup>s</sup>	0 <sup>s</sup> 8 <sup>s</sup>		0 <sup>s</sup> 08 <sup>s</sup>			0 <sup>s</sup> 04 <sup>s</sup>	3 <sup>s</sup> 1 <sup>s</sup>
June 10	31 <sup>s</sup> 18 <sup>s</sup>	0 <sup>s</sup> 02 <sup>s</sup>	12 <sup>s</sup> 1 <sup>s</sup>	15 <sup>s</sup> 29 <sup>s</sup>	37 <sup>s</sup> 3 <sup>s</sup>		60 <sup>s</sup> 97 <sup>s</sup>	25 <sup>s</sup> 7 <sup>s</sup>	
20	31 <sup>s</sup> 20 <sup>s</sup>	0 <sup>s</sup> 00 <sup>s</sup>	11 <sup>s</sup> 3 <sup>s</sup>	15 <sup>s</sup> 34 <sup>s</sup>	37 <sup>s</sup> 7 <sup>s</sup>		60 <sup>s</sup> 86 <sup>s</sup>	28 <sup>s</sup> 6 <sup>s</sup>	
30	31 <sup>s</sup> 20 <sup>s</sup>	0 <sup>s</sup> 04 <sup>s</sup>	10 <sup>s</sup> 5 <sup>s</sup>	15 <sup>s</sup> 35 <sup>s</sup>	38 <sup>s</sup> 0 <sup>s</sup>		60 <sup>s</sup> 68 <sup>s</sup>	31 <sup>s</sup> 3 <sup>s</sup>	
July 10	31 <sup>s</sup> 16 <sup>s</sup>	0 <sup>s</sup> 07 <sup>s</sup>	9 <sup>s</sup> 7 <sup>s</sup>	15 <sup>s</sup> 32 <sup>s</sup>	38 <sup>s</sup> 3 <sup>s</sup>		60 <sup>s</sup> 44 <sup>s</sup>	33 <sup>s</sup> 7 <sup>s</sup>	
		0 <sup>s</sup> 10 <sup>s</sup>	0 <sup>s</sup> 6 <sup>s</sup>		0 <sup>s</sup> 07 <sup>s</sup>			0 <sup>s</sup> 30 <sup>s</sup>	1 <sup>s</sup> 9 <sup>s</sup>
20	31 <sup>s</sup> 09 <sup>s</sup>	0 <sup>s</sup> 13 <sup>s</sup>	9 <sup>s</sup> 1 <sup>s</sup>	15 <sup>s</sup> 25 <sup>s</sup>	38 <sup>s</sup> 5 <sup>s</sup>		60 <sup>s</sup> 14 <sup>s</sup>	35 <sup>s</sup> 6 <sup>s</sup>	
30	30 <sup>s</sup> 99 <sup>s</sup>	0 <sup>s</sup> 15 <sup>s</sup>	8 <sup>s</sup> 5 <sup>s</sup>	15 <sup>s</sup> 15 <sup>s</sup>	38 <sup>s</sup> 6 <sup>s</sup>		59 <sup>s</sup> 79 <sup>s</sup>	37 <sup>s</sup> 2 <sup>s</sup>	
Aug. 9	30 <sup>s</sup> 86 <sup>s</sup>	0 <sup>s</sup> 16 <sup>s</sup>	8 <sup>s</sup> 0 <sup>s</sup>	15 <sup>s</sup> 01 <sup>s</sup>	38 <sup>s</sup> 7 <sup>s</sup>		59 <sup>s</sup> 39 <sup>s</sup>	38 <sup>s</sup> 2 <sup>s</sup>	
19	30 <sup>s</sup> 71 <sup>s</sup>	0 <sup>s</sup> 13 <sup>s</sup>	7 <sup>s</sup> 6 <sup>s</sup>	14 <sup>s</sup> 85 <sup>s</sup>	38 <sup>s</sup> 6 <sup>s</sup>		58 <sup>s</sup> 97 <sup>s</sup>	38 <sup>s</sup> 8 <sup>s</sup>	
		0 <sup>s</sup> 16 <sup>s</sup>	0 <sup>s</sup> 3 <sup>s</sup>		0 <sup>s</sup> 17 <sup>s</sup>			0 <sup>s</sup> 45 <sup>s</sup>	0 <sup>s</sup> 1 <sup>s</sup>
29	30 <sup>s</sup> 55 <sup>s</sup>	0 <sup>s</sup> 16 <sup>s</sup>	7 <sup>s</sup> 3 <sup>s</sup>	14 <sup>s</sup> 68 <sup>s</sup>	38 <sup>s</sup> 4 <sup>s</sup>		58 <sup>s</sup> 52 <sup>s</sup>	38 <sup>s</sup> 9 <sup>s</sup>	
Sept. 8	30 <sup>s</sup> 39 <sup>s</sup>	0 <sup>s</sup> 16 <sup>s</sup>	7 <sup>s</sup> 2 <sup>s</sup>	14 <sup>s</sup> 49 <sup>s</sup>	38 <sup>s</sup> 2 <sup>s</sup>		58 <sup>s</sup> 07 <sup>s</sup>	38 <sup>s</sup> 4 <sup>s</sup>	
18	30 <sup>s</sup> 23 <sup>s</sup>	0 <sup>s</sup> 15 <sup>s</sup>	7 <sup>s</sup> 2 <sup>s</sup>	14 <sup>s</sup> 31 <sup>s</sup>	37 <sup>s</sup> 8 <sup>s</sup>		57 <sup>s</sup> 62 <sup>s</sup>	37 <sup>s</sup> 4 <sup>s</sup>	
28	30 <sup>s</sup> 08 <sup>s</sup>	0 <sup>s</sup> 13 <sup>s</sup>	7 <sup>s</sup> 3 <sup>s</sup>	14 <sup>s</sup> 14 <sup>s</sup>	37 <sup>s</sup> 3 <sup>s</sup>		57 <sup>s</sup> 19 <sup>s</sup>	35 <sup>s</sup> 0 <sup>s</sup>	
		0 <sup>s</sup> 13 <sup>s</sup>	0 <sup>s</sup> 3 <sup>s</sup>		0 <sup>s</sup> 15 <sup>s</sup>			0 <sup>s</sup> 39 <sup>s</sup>	
Oct. 8	29 <sup>s</sup> 95 <sup>s</sup>	0 <sup>s</sup> 11 <sup>s</sup>	7 <sup>s</sup> 6 <sup>s</sup>	13 <sup>s</sup> 99 <sup>s</sup>	36 <sup>s</sup> 9 <sup>s</sup>		56 <sup>s</sup> 80 <sup>s</sup>	3 <sup>s</sup> 1 <sup>s</sup>	
18	29 <sup>s</sup> 84 <sup>s</sup>	0 <sup>s</sup> 06 <sup>s</sup>	8 <sup>s</sup> 1 <sup>s</sup>	13 <sup>s</sup> 87 <sup>s</sup>	36 <sup>s</sup> 4 <sup>s</sup>		56 <sup>s</sup> 45 <sup>s</sup>		
28	29 <sup>s</sup> 78 <sup>s</sup>	0 <sup>s</sup> 02 <sup>s</sup>	8 <sup>s</sup> 7 <sup>s</sup>	13 <sup>s</sup> 79 <sup>s</sup>	35 <sup>s</sup> 9 <sup>s</sup>			0 <sup>s</sup> 35 <sup>s</sup>	
Nov. 7	29 <sup>s</sup> 76 <sup>s</sup>	0 <sup>s</sup> 03 <sup>s</sup>	9 <sup>s</sup> 5 <sup>s</sup>	13 <sup>s</sup> 76 <sup>s</sup>	35 <sup>s</sup> 4 <sup>s</sup>			0 <sup>s</sup> 29 <sup>s</sup>	
		0 <sup>s</sup> 03 <sup>s</sup>	1 <sup>s</sup> 1 <sup>s</sup>		0 <sup>s</sup> 02 <sup>s</sup>			0 <sup>s</sup> 3 <sup>s</sup>	
17	29 <sup>s</sup> 79 <sup>s</sup>	0 <sup>s</sup> 09 <sup>s</sup>	10 <sup>s</sup> 6 <sup>s</sup>	13 <sup>s</sup> 78 <sup>s</sup>	35 <sup>s</sup> 1 <sup>s</sup>			0 <sup>s</sup> 2 <sup>s</sup>	
27	29 <sup>s</sup> 88 <sup>s</sup>	0 <sup>s</sup> 13 <sup>s</sup>	12 <sup>s</sup> 0 <sup>s</sup>	13 <sup>s</sup> 87 <sup>s</sup>	34 <sup>s</sup> 9 <sup>s</sup>			0 <sup>s</sup> 0 <sup>s</sup>	
Dec. 7	30 <sup>s</sup> 01 <sup>s</sup>	0 <sup>s</sup> 18 <sup>s</sup>	13 <sup>s</sup> 4 <sup>s</sup>	14 <sup>s</sup> 01 <sup>s</sup>	34 <sup>s</sup> 9 <sup>s</sup>			0 <sup>s</sup> 1 <sup>s</sup>	
17	30 <sup>s</sup> 19 <sup>s</sup>	0 <sup>s</sup> 22 <sup>s</sup>	15 <sup>s</sup> 0 <sup>s</sup>	14 <sup>s</sup> 20 <sup>s</sup>	35 <sup>s</sup> 0 <sup>s</sup>			0 <sup>s</sup> 4 <sup>s</sup>	
		0 <sup>s</sup> 22 <sup>s</sup>	1 <sup>s</sup> 6 <sup>s</sup>		0 <sup>s</sup> 23 <sup>s</sup>			0 <sup>s</sup> 4 <sup>s</sup>	
27	30 <sup>s</sup> 41 <sup>s</sup>	0 <sup>s</sup> 25 <sup>s</sup>	16 <sup>s</sup> 6 <sup>s</sup>	14 <sup>s</sup> 43 <sup>s</sup>	35 <sup>s</sup> 4 <sup>s</sup>			0 <sup>s</sup> 1 <sup>s</sup>	
37	30 <sup>s</sup> 66 <sup>s</sup>		18 <sup>s</sup> 3 <sup>s</sup>	14 <sup>s</sup> 71 <sup>s</sup>	35 <sup>s</sup> 9 <sup>s</sup>				



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	α Trianguli Australis.		ε Ursæ Minoris.	
	R. A.	Dec. South.	R. A.	Dec. North.
	<sup>h</sup> 16	<sup>°</sup> 68	<sup>h</sup> 17	<sup>°</sup> 82
Jan. 1	<sup>m</sup> 32 <sup>s</sup> 46 <sup>s</sup> 35 0 <sup>s</sup> 58	<sup>m</sup> 44 <sup>s</sup> 16 <sup>s</sup> 7 1 <sup>s</sup> 5	<sup>m</sup> 1 <sup>s</sup> 22 <sup>s</sup> 03 0 <sup>s</sup> 71	<sup>m</sup> 16 <sup>s</sup> 32 <sup>s</sup> 3 3 <sup>s</sup> 3
11	46 93 0 <sup>s</sup> 65	15 2 1 <sup>s</sup> 1	22 74 0 <sup>s</sup> 98	29 0 2 <sup>s</sup> 9
21	47 58 0 <sup>s</sup> 70	14 1 0 <sup>s</sup> 7	23 72 1 <sup>s</sup> 23	26 1 2 <sup>s</sup> 6
31	48 28 0 <sup>s</sup> 74	13 4 0 <sup>s</sup> 3	24 95 1 <sup>s</sup> 41	23 5 1 <sup>s</sup> 9
Feb. 10	49 02 0 <sup>s</sup> 76	13 1 0 <sup>s</sup> 2	26 36 1 <sup>s</sup> 56	21 6 1 <sup>s</sup> 4
20	49 78 0 <sup>s</sup> 75	13 3 0 <sup>s</sup> 6	27 92 1 <sup>s</sup> 63	20 2 0 <sup>s</sup> 7
Mar. 2	50 53 0 <sup>s</sup> 73	13 9 0 <sup>s</sup> 9	29 55 1 <sup>s</sup> 68	19 5 0 <sup>s</sup> 1
12	51 26 0 <sup>s</sup> 71	14 8 1 <sup>s</sup> 3	31 20 1 <sup>s</sup> 61	19 4 0 <sup>s</sup> 6
22	51 97 0 <sup>s</sup> 67	16 1 1 <sup>s</sup> 6	32 81 1 <sup>s</sup> 50	20 0 1 <sup>s</sup> 1
Apr. 1	52 64 0 <sup>s</sup> 62	17 7 1 <sup>s</sup> 9	34 31 1 <sup>s</sup> 36	21 1 1 <sup>s</sup> 8
11	53 26 0 <sup>s</sup> 55	19 6 2 <sup>s</sup> 2	35 67 1 <sup>s</sup> 16	22 9 2 <sup>s</sup> 2
21	53 81 0 <sup>s</sup> 50	21 8 2 <sup>s</sup> 3	36 83 0 <sup>s</sup> 93	25 1 2 <sup>s</sup> 6
May 1	54 31 0 <sup>s</sup> 43	24 1 2 <sup>s</sup> 5	37 76 0 <sup>s</sup> 67	27 7 2 <sup>s</sup> 9
11	54 74 0 <sup>s</sup> 32	26 6 2 <sup>s</sup> 6	38 43 0 <sup>s</sup> 41	30 6 3 <sup>s</sup> 1
21	55 06 0 <sup>s</sup> 24	29 2 2 <sup>s</sup> 6	38 84 0 <sup>s</sup> 12	33 7 3 <sup>s</sup> 1
31	55 30 0 <sup>s</sup> 15	31 8 2 <sup>s</sup> 7	38 96 0 <sup>s</sup> 16	36 8 3 <sup>s</sup> 2
June 10	55 45 0 <sup>s</sup> 05	34 5 2 <sup>s</sup> 6	38 80 0 <sup>s</sup> 45	40 0 3 <sup>s</sup> 0
20	55 50 0 <sup>s</sup> 05	37 1 2 <sup>s</sup> 4	38 35 0 <sup>s</sup> 70	43 0 2 <sup>s</sup> 8
30	55 45 0 <sup>s</sup> 14	39 5 2 <sup>s</sup> 2	37 65 0 <sup>s</sup> 94	45 8 2 <sup>s</sup> 6
July 10	55 31 0 <sup>s</sup> 24	41 7 2 <sup>s</sup> 0	36 71 1 <sup>s</sup> 17	48 4 2 <sup>s</sup> 2
20	55 07 0 <sup>s</sup> 32	43 7 1 <sup>s</sup> 7	35 54 1 <sup>s</sup> 36	50 6 1 <sup>s</sup> 9
30	54 75 0 <sup>s</sup> 40	45 4 1 <sup>s</sup> 2	34 18 1 <sup>s</sup> 52	52 5 1 <sup>s</sup> 4
Aug. 9	54 35 0 <sup>s</sup> 46	46 6 0 <sup>s</sup> 9	32 66 1 <sup>s</sup> 64	53 9 0 <sup>s</sup> 9
19	53 89 0 <sup>s</sup> 50	47 5 0 <sup>s</sup> 4	31 02 1 <sup>s</sup> 74	54 8 0 <sup>s</sup> 5
29	53 39 0 <sup>s</sup> 52	47 9 0 <sup>s</sup> 1	29 28 1 <sup>s</sup> 78	55 3 0 <sup>s</sup> 0
Sept. 8	52 87 0 <sup>s</sup> 52	47 8 0 <sup>s</sup> 6	27 50 1 <sup>s</sup> 80	53 3 0 <sup>s</sup> 8
18	52 35 0 <sup>s</sup> 49	47 2 1 <sup>s</sup> 0	25 70 1 <sup>s</sup> 76	54 8 1 <sup>s</sup> 1
28	51 86 0 <sup>s</sup> 44	46 2 1 <sup>s</sup> 5	23 94 1 <sup>s</sup> 69	53 7 1 <sup>s</sup> 5
Oct. 8	51 42 0 <sup>s</sup> 37	44 7 1 <sup>s</sup> 8	22 25 1 <sup>s</sup> 58	52 2 2 <sup>s</sup> 0
18	51 05 0 <sup>s</sup> 27	42 9 2 <sup>s</sup> 1	20 67 1 <sup>s</sup> 41	50 2 2 <sup>s</sup> 4
28	50 78 0 <sup>s</sup> 17	40 8 2 <sup>s</sup> 4	19 26 1 <sup>s</sup> 22	47 8 2 <sup>s</sup> 8
Nov. 7	50 61 0 <sup>s</sup> 04	38 4 2 <sup>s</sup> 5	18 04 0 <sup>s</sup> 98	45 0 3 <sup>s</sup> 1
17	50 57 0 <sup>s</sup> 07	35 9 2 <sup>s</sup> 4	17 06 0 <sup>s</sup> 71	41 9 3 <sup>s</sup> 4
27	* 50 64 0 <sup>s</sup> 24	33 5 2 <sup>s</sup> 7	* 16 35 0 <sup>s</sup> 44	38 5 3 <sup>s</sup> 9
Dec. 7	51 22 0 <sup>s</sup> 45	30 8 2 <sup>s</sup> 2	15 91 0 <sup>s</sup> 08	34 6 3 <sup>s</sup> 8
17	51 67 0 <sup>s</sup> 54	28 6 2 <sup>s</sup> 0	15 83 0 <sup>s</sup> 24	30 8 3 <sup>s</sup> 5
27	32 52 21	26 6 1 <sup>s</sup> 7	16 07 0 <sup>s</sup> 55	27 3 3 <sup>s</sup> 4
37	44 24 9	16 62	16 23 9	

APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ HERCULIS.		$\beta$ DRACONIS.		$\alpha$ OPHIUCHI.	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 17	<sup>m</sup> 7	<sup>h</sup> 17	<sup>m</sup> 27	<sup>h</sup> 17	<sup>m</sup> 27
	<sup>s</sup> 14	<sup>s</sup> 33	<sup>s</sup> 52	<sup>s</sup> 24	<sup>s</sup> 12	<sup>s</sup> 40
Jan. 1	46° 68'	0° 21'	0° 23'	54° 1'	56° 47'	29° 5'
11	46° 89'	0° 24'	0° 44'	50° 7'	56° 66'	27° 2'
21	47° 13'	0° 25'	0° 70'	47° 5'	56° 88'	25° 1'
31	47° 38'	0° 28'	1° 02'	44° 7'	57° 13'	23° 2'
Feb. 10	47° 66'	0° 29'	1° 37'	42° 3'	57° 39'	21° 5'
20	47° 95'	0° 29'	1° 76'	40° 5'	57° 67'	20° 2'
Mar. 2	48° 24'	0° 29'	2° 16'	39° 3'	57° 96'	19° 2'
12	48° 53'	0° 28'	2° 57'	38° 8'	58° 25'	18° 7'
22	48° 81'	0° 28'	2° 97'	38° 9'	58° 53'	18° 6'
Apr. 1	49° 09'	0° 25'	3° 37'	39° 7'	58° 81'	18° 9'
11	49° 34'	0° 24'	3° 73'	41° 0'	59° 07'	19° 6'
21	49° 58'	0° 22'	4° 07'	42° 9'	59° 32'	20° 6'
May 1	49° 80'	0° 19'	4° 37'	45° 3'	59° 55'	21° 9'
11	49° 99'	0° 17'	4° 62'	48° 0'	59° 76'	23° 5'
21	50° 16'	0° 13'	4° 83'	50° 9'	59° 95'	25° 2'
31	50° 29'	0° 10'	4° 98'	54° 0'	60° 10'	27° 1'
June 10	50° 39'	0° 06'	5° 07'	57° 2'	60° 22'	29° 0'
20	50° 45'	0° 03'	5° 10'	60° 4'	60° 30'	30° 8'
30	50° 48'	0° 01'	5° 07'	63° 4'	60° 35'	32° 6'
July 10	50° 47'	0° 05'	4° 99'	66° 2'	60° 36'	34° 3'
20	50° 42'	0° 08'	4° 84'	68° 8'	60° 33'	35° 8'
30	50° 34'	0° 12'	4° 65'	71° 1'	60° 26'	37° 1'
Aug. 9	50° 22'	0° 14'	4° 40'	72° 9'	60° 16'	38° 2'
19	50° 08'	0° 17'	4° 12'	74° 3'	60° 02'	39° 1'
29	49° 91'	0° 18'	3° 80'	75° 3'	59° 86'	39° 7'
Sept. 8	49° 73'	0° 19'	3° 46'	75° 8'	59° 69'	40° 0'
18	49° 54'	0° 19'	3° 11'	75° 8'	59° 50'	40° 1'
28	49° 35'	0° 17'	2° 76'	75° 2'	59° 31'	39° 8'
Oct. 8	49° 18'	0° 15'	2° 42'	74° 2'	59° 13'	39° 5'
18	49° 03'	0° 13'	2° 10'	72° 7'		
28	48° 90'	0° 09'	1° 82'	70° 7'		
Nov. 7	48° 81'	0° 04'	1° 59'	68° 2'		
17	48° 77'	0° 01'	1° 42'	65° 4'		
27	48° 78'	0° 05'	1° 31'	62° 2'		
Dec. 7	48° 83'	0° 12'	1° 27'	58° 8'		
17	48° 95'	0° 15'	1° 30'	54° 8'		
27	49° 10'	0° 19'	1° 41'	51° 2'		
37	49° 29'	0° 24'	1° 59'	47° 7'		



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ Octantis.			$\gamma$ DRACONIS.		
	R. A.	Dec. South.		R. A.	Dec. North.	
	<sup>h</sup> 17	<sup>°</sup> 89		<sup>h</sup> 17	<sup>°</sup> 51	
Jan. 1	<sup>m</sup> 28 <sup>s</sup> 7.64 <sup>s</sup>	16' 7.3"	2.9	<sup>m</sup> 53 <sup>s</sup> 5.03 <sup>s</sup>	30' 34.4"	3.5
11	28 18.55 10.91	4.4	2.4	5.20 0.17	30.9	3.3
21	28 32.11 13.56	2.0	2.0	5.42 0.22	27.6	3.0
31	28 47.94 15.83	16 0.0	1.6	5.70 0.28	24.6	2.5
Feb. 10	29 5.57 17.63	15 58.4	1.0	6.02 0.32	22.1	2.0
20	29 24.51 18.94	57.4	0.6	6.38 0.36	20.1	1.5
Mar. 2	29 41.28 19.77	56.8	0.1	6.76 0.38	18.6	0.8
12	30 4.47 20.19	56.7	0.4	7.16 0.40	17.8	0.2
22	30 24.54 20.07	57.1	0.9	7.56 0.40	17.6	0.5
Apr. 1	30 41.08 19.54	58.0	1.4	7.95 0.39	18.1	1.1
11	31 2.70 18.62	15 59.4	1.7	8.33 0.38	19.2	1.7
21	31 20.01 17.31	16 1.1	2.1	8.68 0.35	20.9	2.1
May 1	31 35.62 15.61	3.2	2.5	9.00 0.32	23.0	2.6
11	31 49.23 13.61	5.7	2.8	9.28 0.28	25.6	2.8
21	32 0.60 11.37	8.5	2.9	9.52 0.24	28.4	3.1
31	32 9.37 8.77	11.4	3.1	9.70 0.18	31.5	3.2
June 10	32 15.42 6.05	14.5	3.2	9.83 0.13	34.7	3.2
20	32 18.60 3.18	17.7	3.2	9.90 0.07	37.9	3.2
30	32 18.88 0.28	20.9	3.1	9.92 0.02	41.1	2.9
July 10	32 16.19 2.69	24.0	2.9	9.87 0.05	44.0	2.8
20	32 10.63 5.56	26.9	2.7	9.76 0.11	46.8	2.5
30	32 2.35 8.28	29.6	2.3	9.60 0.16	49.3	2.1
Aug. 9	31 51.63 10.72	31.9	1.8	9.38 0.22	51.4	1.7
19	31 38.70 12.93	33.7	1.4	9.13 0.25	53.1	1.3
29	31 24.29 14.41	35.1	0.8	8.83 0.30	54.4	0.8
Sept. 8	31 8.57 15.72	35.9	0.3	8.50 0.33	55.2	0.4
18	30 52.27 16.30	36.2	0.4	8.16 0.34	55.6	0.2
28	30 35.97 16.30	35.8	0.9	7.81 0.35	55.4	0.7
Oct. 8	30 19.98 15.99	34.9	1.5	7.47 0.34	54.7	1.2
18	30 5.84 14.14	33.4	2.0	7.15 0.32	53.5	1.7
28	29 53.23 12.61	31.4	2.5	6.86 0.29	51.8	2.1
Nov. 7	29 43.03 10.20	28.9	2.8	6.60 0.26	49.7	2.7
17	29 35.64 7.39	26.1	3.0	6.40 0.20	47.0	3.0
27	29 31.40 4.24	23.1	3.2	6.26 0.14	44.0	3.1
Dec. 7	29 30.51 0.89	19.9	3.5	6.18 0.08	40.9	3.3
17	29 33.41 2.90	16.4	3.1	6.18 0.00	37.4	3.9
27	29 39.63 6.22	13.3	2.9	* 6.25 0.07	33.5	3.6
37	29 48.93 9.30	16 10.4	53 6.38 0.13	30 29.9		

## APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\mu^1$ Sagittarii.		$\alpha$ LYRE. (Vega)		$\beta$ LYRE.	
	R. A.	Dec. South.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 18 <sup>m</sup> 4	<sup>o</sup> 21 <sup>i</sup> 5	<sup>h</sup> 18 <sup>m</sup> 31	<sup>o</sup> 38 <sup>i</sup> 38	<sup>h</sup> 18 <sup>m</sup> 44	<sup>o</sup> 33 <sup>i</sup> 11
Jan. 1	45° 43' 0" 19	26° 5' 0" 3	49° 48' 0" 12	55° 0' 0" 2	30° 51' 0" 11	36° 0' 0" 3
11	45° 62' 0" 22	26° 8' 0" 3	49° 60' 0" 16	51° 8' 0" 1	30° 62' 0" 15	32° 7' 0" 2
21	45° 84' 0" 25	27° 1' 0" 4	49° 76' 0" 20	48° 7' 0" 2	30° 77' 0" 18	29° 8' 0" 2
31	46° 09' 0" 27	27° 5' 0" 3	49° 96' 0" 25	45° 8' 0" 2	30° 95' 0" 22	27° 1' 0" 2
Feb. 10	46° 36' 0" 28	27° 8' 0" 2	50° 21' 0" 27	43° 3' 0" 2	31° 17' 0" 26	24° 7' 0" 2
20	46° 64' 0" 30	28° 0' 0" 3	50° 48' 0" 30	41° 2' 0" 1	31° 43' 0" 27	22° 6' 0" 1
Mar. 2	46° 94' 0" 31	28° 3' 0" 1	50° 78' 0" 32	39° 6' 0" 1	31° 70' 0" 30	21° 0' 0" 1
12	47° 25' 0" 31	28° 4' 0" 0	51° 10' 0" 33	38° 6' 0" 0	32° 00' 0" 31	19° 9' 0" 0
22	47° 56' 0" 31	28° 4' 0" 0	51° 43' 0" 33	38° 1' 0" 0	32° 31' 0" 31	19° 4' 0" 0
Apr. 1	47° 87' 0" 30	28° 4' 0" 1	51° 76' 0" 33	38° 2' 0" 0	32° 62' 0" 31	19° 5' 0" 0
11	48° 17' 0" 29	28° 3' 0" 2	52° 09' 0" 32	38° 9' 0" 0	32° 93' 0" 31	20° 1' 0" 0
21	48° 46' 0" 28	28° 1' 0" 2	52° 41' 0" 30	40° 2' 0" 1	33° 24' 0" 30	21° 2' 0" 1
May 1	48° 74' 0" 27	27° 9' 0" 3	52° 71' 0" 28	41° 9' 0" 2	33° 54' 0" 28	22° 8' 0" 2
11	49° 01' 0" 24	27° 6' 0" 3	52° 99' 0" 25	44° 1' 0" 2	33° 82' 0" 25	24° 8' 0" 2
21	49° 25' 0" 21	27° 3' 0" 2	53° 24' 0" 21	46° 6' 0" 2	34° 07' 0" 22	27° 2' 0" 2
31	49° 46' 0" 18	27° 1' 0" 2	53° 45' 0" 18	49° 4' 0" 2	34° 29' 0" 19	29° 8' 0" 2
June 10	49° 64' 0" 15	26° 9' 0" 1	53° 63' 0" 13	52° 3' 0" 3	34° 48' 0" 14	32° 6' 0" 2
20	49° 79' 0" 11	26° 8' 0" 1	53° 76' 0" 08	55° 3' 0" 3	34° 62' 0" 10	35° 4' 0" 2
30	49° 90' 0" 06	26° 7' 0" 0	53° 84' 0" 04	58° 3' 0" 2	34° 72' 0" 06	38° 2' 0" 2
July 10	49° 96' 0" 02	26° 7' 0" 1	53° 88' 0" 02	61° 2' 0" 2	34° 78' 0" 00	41° 0' 0" 2
20	49° 98' 0" 02	26° 8' 0" 1	53° 86' 0" 07	63° 9' 0" 2	34° 78' 0" 04	43° 7' 0" 2
30	49° 96' 0" 07	26° 9' 0" 1	53° 79' 0" 11	66° 5' 0" 2	34° 74' 0" 08	46° 1' 0" 2
Aug. 9	49° 89' 0" 10	27° 0' 0" 2	53° 68' 0" 16	68° 7' 0" 1	34° 66' 0" 13	48° 3' 0" 1
19	49° 79' 0" 14	27° 2' 0" 2	53° 52' 0" 20	70° 6' 0" 1	34° 53' 0" 17	50° 2' 0" 1
29	49° 65' 0" 16	27° 4' 0" 1	53° 32' 0" 22	72° 2' 0" 1	34° 36' 0" 20	51° 7' 0" 1
Sept. 8	49° 49' 0" 18	27° 5' 0" 1	53° 10' 0" 25	73° 3' 0" 0	34° 16' 0" 22	52° 9' 0" 0
18	49° 31' 0" 19	27° 6' 0" 1	52° 85' 0" 26	74° 0' 0" 0	33° 94' 0" 23	53° 6' 0" 0
28	49° 12' 0" 19	27° 7' 0" 1	52° 59' 0" 26	74° 3' 0" 0	33° 71' 0" 24	54° 0' 0" 0
Oct. 8	48° 93' 0" 17	27° 8' 0" 0	52° 33' 0" 25	74° 1' 0" 0	33° 47' 0" 24	51° 7' 0" 0
18	48° 76' 0" 14	27° 8' 0" 0	52° 08' 0" 24	73° 5' 0" 0	33° 33' 0" 24	51° 7' 0" 0
28	48° 62' 0" 12	27° 8' 0" 0	51° 84' 0" 20	72° 4' 0" 0	33° 21' 0" 24	51° 7' 0" 0
Nov. 7	48° 50' 0" 07	27° 8' 0" 0	51° 64' 0" 17	70° 8' 0" 0	33° 11' 0" 24	51° 7' 0" 0
17	48° 43' 0" 02	27° 8' 0" 0	51° 47' 0" 12	68° 8' 0" 0	33° 03' 0" 24	51° 7' 0" 0
27	48° 41' 0" 02	27° 8' 0" 0	51° 35' 0" 08	66° 4' 0" 0	32° 57' 0" 24	51° 7' 0" 0
Dec. 7	48° 43' 0" 07	27° 9' 0" 1	51° 27' 0" 02	63° 7' 0" 0	32° 53' 0" 24	51° 7' 0" 0
17	48° 50' 0" 14	28° 0' 0" 2	51° 25' 0" 03	60° 8' 0" 0	32° 50' 0" 24	51° 7' 0" 0
27	48° 64' 0" 17	28° 2' 0" 3	51° 28' 0" 10	57° 6' 0" 0	32° 48' 0" 24	51° 7' 0" 0
37	48° 81' 0" 17	28° 5' 0" 3	51° 38' 0" 10	54° 0' 0" 0	32° 47' 0" 24	51° 7' 0" 0



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	ζ AQUILÆ.		δ AQUILÆ.		γ AQUILÆ.	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 18 <sup>m</sup> 58	<sup>°</sup> 13 <sup>'</sup> 38	<sup>h</sup> 19 <sup>m</sup> 17	<sup>°</sup> 2 <sup>'</sup> 49	<sup>h</sup> 19 <sup>m</sup> 39	<sup>°</sup> 10 <sup>'</sup> 1
Jan. 1	29° 01' 0"	45° 9' 2"	54° 11' 0"	16° 4' 1"	5° 82' 0"	10° 5' 1"
11	29° 12' 0"	43° 6' 2"	54° 21' 0"	14° 7' 1"	5° 88' 0"	8° 7' 2"
21	29° 26' 0"	41° 5' 1"	54° 34' 0"	13° 3' 1"	5° 99' 0"	6° 7' 2"
31	29° 43' 0"	39° 6' 1"	54° 50' 0"	12° 0' 1"	6° 12' 0"	5° 0' 1"
	0° 20'	1° 7'	0° 19'	1° 2'	0° 17'	1° 1'
Feb. 10	29° 63' 0"	37° 9' 1"	54° 69' 0"	10° 8' 1"	6° 29' 0"	3° 5' 1"
20	29° 86' 0"	36° 4' 1"	54° 90' 0"	9° 8' 1"	6° 48' 0"	2° 2' 1"
Mar. 2	30° 10' 0"	35° 3' 1"	55° 14' 0"	9° 1' 0"	6° 70' 0"	1° 2' 1"
12	30° 37' 0"	34° 6' 0"	55° 39' 0"	8° 7' 0"	6° 94' 0"	0° 6' 0"
	0° 27'	0° 3'	0° 26'	0° 1'	0° 26'	0° 0'
22	30° 64' 0"	34° 3' 0"	55° 65' 0"	8° 6' 0"	7° 20' 0"	0° 3' 0"
Apr. 1	30° 92' 0"	34° 5' 0"	55° 93' 0"	8° 9' 0"	7° 47' 0"	0° 4' 0"
11	31° 21' 0"	35° 0' 0"	56° 21' 0"	9° 5' 0"	7° 75' 0"	0° 9' 0"
21	31° 49' 0"	35° 9' 0"	56° 50' 0"	10° 3' 0"	8° 04' 0"	1° 8' 0"
	0° 28'	1° 3'	0° 28'	1° 1'	0° 29'	1° 1'
May 1	31° 77' 0"	37° 2' 1"	56° 78' 0"	11° 4' 1"	8° 33' 0"	3° 0' 1"
11	32° 04' 0"	38° 8' 1"	57° 06' 0"	12° 8' 1"	8° 61' 0"	4° 5' 1"
21	32° 29' 0"	40° 6' 1"	57° 32' 0"	14° 3' 1"	8° 88' 0"	6° 2' 1"
31	32° 52' 0"	42° 6' 0"	57° 57' 0"	15° 9' 1"	9° 14' 0"	8° 1' 1"
	0° 20'	2° 1'	0° 22'	1° 7'	0° 23'	1° 1'
June 10	32° 72' 0"	44° 7' 1"	57° 79' 0"	17° 6' 1"	9° 37' 0"	10° 1' 1"
20	32° 88' 0"	46° 8' 1"	57° 98' 0"	19° 3' 1"	9° 57' 0"	12° 1' 1"
30	33° 01' 0"	48° 9' 1"	58° 13' 0"	20° 9' 1"	9° 74' 0"	14° 1' 1"
July 10	33° 10' 0"	51° 0' 1"	58° 25' 0"	22° 4' 1"	9° 86' 0"	16° 1' 1"
	0° 04'	1° 9'	0° 07'	1° 4'	0° 09'	1° 1'
20	33° 14' 0"	52° 9' 1"	58° 32' 0"	23° 8' 1"	9° 95' 0"	18° 0' 1"
30	33° 15' 0"	54° 6' 1"	58° 35' 0"	25° 1' 1"	9° 99' 0"	19° 7' 1"
Aug. 9	33° 11' 0"	56° 1' 1"	58° 33' 0"	26° 2' 1"	9° 99' 0"	21° 2' 1"
19	33° 03' 0"	57° 4' 1"	58° 28' 0"	27° 1' 1"	9° 95' 0"	22° 5' 1"
	0° 12'	1° 1'	0° 09'	0° 7'	0° 09'	1° 1'
29	32° 91' 0"	58° 5' 0"	58° 19' 0"	27° 8' 0"	9° 86' 0"	23° 6' 1"
Sept. 8	32° 76' 0"	59° 3' 0"	58° 06' 0"	28° 3' 0"	9° 74' 0"	24° 5' 1"
18	32° 59' 0"	59° 8' 0"	57° 91' 0"	28° 6' 0"	9° 60' 0"	25° 1' 1"
28	32° 41' 0"	60° 0' 0"	57° 74' 0"	28° 7' 0"	9° 43' 0"	25° 4' 1"
	0° 19'	0° 1'	0° 17'	0° 1'	0° 18'	1° 1'
Oct. 8	32° 22' 0"	59° 9' 0"	57° 57' 0"	28° 6' 0"	9° 25' 0"	25° 4' 1"
18	32° 03' 0"	59° 6' 0"	57° 39' 0"	28° 3' 0"	9° 07' 0"	25° 2' 1"
28	31° 86' 0"	58° 9' 0"	57° 23' 0"	27° 8' 0"	8° 90' 0"	24° 8' 1"
Nov. 7	31° 71' 0"	57° 9' 0"	57° 08' 0"	27° 2' 0"	8° 74' 0"	24° 1' 1"
	0° 12'	1° 2'	0° 12'	0° 9'	0° 14'	1° 1'
17	31° 59' 0"	56° 7' 0"	56° 96' 0"	26° 3' 0"	8° 60' 0"	23° 1' 1"
27	31° 50' 0"	55° 2' 0"	56° 88' 0"	25° 2' 0"	8° 50' 0"	21° 9' 1"
Dec. 7	31° 45' 0"	53° 5' 0"	56° 83' 0"	24° 0' 0"	8° 43' 0"	20° 5' 1"
17	31° 45' 0"	51° 6' 0"	56° 82' 0"	22° 7' 0"	8° 39' 0"	18° 9' 1"
	0° 04'	2° 1'	0° 03'	1° 4'	0° 01'	1° 1'
27	31° 49' 0"	49° 5' 0"	56° 85' 0"	21° 3' 0"	8° 40' 0"	17° 2' 1"
37	31° 58' 0"	47° 2' 0"	56° 92' 0"	19° 8' 0"	8° 44' 0"	15° 4' 1"



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ AQUILÆ. (Altair)		$\beta$ AQUILÆ.		$\alpha^2$ CAPRICORNI.	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. South.
	<sup>h</sup> 19 <sup>m</sup> 43	<sup>°</sup> 8 <sup>'</sup> 28	<sup>h</sup> 19 <sup>m</sup> 47	<sup>°</sup> 6 <sup>'</sup> 2	<sup>h</sup> 20 <sup>m</sup> 9	<sup>°</sup> 13 <sup>'</sup> 0
Jan. 1	25° 97' 0.06	38° 8' 1.7	54° 79' 0.06	13° 8' 1.6	41° 62' 0.05	19° 4' 0.4
11	26° 03' 0.11	37° 1' 1.9	54° 85' 0.11	12° 2' 1.7	41° 67' 0.09	19° 8' 0.4
21	26° 14' 0.13	35° 2' 1.5	54° 96' 0.13	10° 5' 1.5	41° 76' 0.13	20° 2' 0.3
31	26° 27' 0.16	33° 7' 1.5	55° 09' 0.15	9° 0' 1.2	41° 89' 0.15	20° 5' 0.1
Feb. 10	26° 43' 0.19	32° 2' 1.2	55° 24' 0.19	7° 8' 1.1	42° 04' 0.18	20° 6' 0.0
20	26° 62' 0.22	31° 0' 0.9	55° 43' 0.21	6° 7' 0.9	42° 22' 0.21	20° 6' 0.1
Mar. 2	26° 84' 0.24	30° 1' 0.5	55° 64' 0.24	5° 8' 0.5	42° 43' 0.23	20° 5' 0.3
12	27° 08' 0.25	29° 6' 0.3	55° 88' 0.25	5° 3' 0.1	42° 66' 0.25	20° 2' 0.5
22	27° 33' 0.27	29° 3' 0.2	56° 13' 0.27	5° 2' 0.1	42° 91' 0.27	19° 7' 0.7
Apr. 1	27° 60' 0.29	29° 5' 0.5	56° 40' 0.28	5° 3' 0.6	43° 18' 0.29	19° 0' 0.9
11	27° 89' 0.29	30° 0' 0.9	56° 68' 0.29	5° 9' 0.8	43° 47' 0.30	18° 1' 1.0
21	28° 18' 0.28	30° 9' 1.2	56° 97' 0.29	6° 7' 1.2	43° 77' 0.30	17° 1' 1.1
May 1	28° 46' 0.29	32° 1' 1.5	57° 26' 0.28	7° 9' 1.4	44° 07' 0.30	16° 0' 1.2
11	28° 75' 0.27	33° 6' 1.6	57° 54' 0.28	9° 3' 1.6	44° 37' 0.30	14° 8' 1.2
21	29° 02' 0.26	35° 2' 1.9	57° 82' 0.26	10° 9' 1.8	44° 67' 0.29	13° 6' 1.2
31	29° 28' 0.24	37° 1' 1.9	58° 08' 0.24	12° 7' 1.8	44° 96' 0.26	12° 4' 1.2
June 10	29° 52' 0.20	39° 0' 2.0	58° 32' 0.21	14° 5' 1.9	45° 22' 0.25	11° 2' 1.1
20	29° 72' 0.18	41° 0' 2.0	58° 53' 0.17	16° 4' 1.8	45° 47' 0.21	10° 1' 1.0
30	29° 90' 0.13	43° 0' 1.9	58° 70' 0.14	18° 2' 1.8	45° 68' 0.17	9° 1' 0.8
July 10	30° 03' 0.09	44° 9' 1.8	58° 84' 0.10	20° 0' 1.6	45° 85' 0.13	8° 3' 0.7
20	30° 12' 0.05	46° 7' 1.6	58° 94' 0.05	21° 6' 1.5	45° 98' 0.09	7° 6' 0.5
30	30° 17' 0.01	48° 3' 1.5	58° 99' 0.01	23° 1' 1.4	46° 07' 0.04	7° 1' 0.3
Aug. 9	30° 18' 0.04	49° 8' 1.3	59° 00' 0.03	24° 5' 1.1	46° 11' 0.00	6° 8' 0.2
19	30° 14' 0.08	51° 1' 1.0	58° 97' 0.07	25° 6' 0.9	46° 11' 0.05	6° 6' 0.0
29	30° 06' 0.11	52° 1' 0.8	58° 90' 0.11	26° 5' 0.7	46° 06' 0.09	6° 6' 0.1
Sept. 8	29° 95' 0.14	52° 9' 0.6	58° 79' 0.14	27° 2' 0.5	45° 97' 0.12	6° 7' 0.2
18	29° 81' 0.17	53° 5' 0.3	58° 65' 0.16	27° 7' 0.2	45° 85' 0.14	6° 9' 0.3
28	29° 64' 0.17	53° 8' 0.0	58° 49' 0.17	27° 9' 0.0	45° 71' 0.16	7° 2' 0.3
Oct. 8	29° 47' 0.18	53° 8' 0.2	58° 32' 0.17	27° 9' 0.2	45° 55' 0.17	7° 5' 0.5
18	29° 29' 0.17	53° 6' 0.4	58° 15' 0.17	27° 7' 0.4	45° 38' 0.17	8° 0' 0.4
28	29° 12' 0.16	53° 2' 0.7	57° 98' 0.16	27° 3' 0.7	45° 21' 0.15	8° 4' 0.5
Nov. 7	28° 96' 0.13	52° 5' 0.9	57° 82' 0.13	26° 6' 0.9	45° 06' 0.14	8° 9' 0.4
17	28° 83' 0.10	51° 6' 1.1	57° 69' 0.11	25° 7' 1.0	44° 92' 0.11	9° 3' 0.5
27	28° 73' 0.07	50° 5' 1.3	57° 58' 0.07	24° 7' 1.3	44° 81' 0.08	9° 8' 0.5
Dec. 7	28° 66' 0.04	49° 2' 1.5	57° 51' 0.04	23° 4' 1.4	44° 73' 0.04	10° 3' 0.5
17	28° 62' 0.01	47° 7' 1.6	57° 47' 0.00	22° 0' 1.5	44° 69' 0.00	10° 8' 0.5
27	28° 63' 0.04	46° 1' 1.7	57° 47' 0.04	20° 5' 1.5	44° 69' 0.03	11° 2' 0.5
37	28° 67' 0.04	44° 4' 1.7	57° 51' 0.04	19° 0' 1.5	44° 72' 0.03	11° 1' 0.5



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\lambda$ Ursæ Minoris.		$\alpha$ Pavonis.	
	R. A.	Dec. North.	R. A.	Dec. South.
	20 <sup>h</sup>	88 <sup>o</sup>	20 <sup>h</sup>	57 <sup>o</sup>
Jan. 1	12 <sup>m</sup> 24 <sup>s</sup> 39 <sup>s</sup>	51 <sup>i</sup> 51 <sup>u</sup> 0 <sup>u</sup>	13 <sup>m</sup> 41 <sup>s</sup> 50 <sup>s</sup>	12 <sup>i</sup> 38 <sup>u</sup> 0 <sup>u</sup>
11	19 31 5 08	48 0 3 0	41 55 0 05	35 8 2 2
21	16 33 2 98	44 7 3 3	41 67 0 12	33 5 2 3
31	* 15 55 0 78	41 1 3 6	* 41 87 0 20	31 0 2 5
	1 58	3 3	0 25	2 3
Feb. 10	17 13 3 66	37 8 3 0	42 12 0 30	28 7 2 2
20	20 79 5 59	34 8 2 8	42 42 0 36	26 4 2 2
Mar. 2	26 38 7 25	32 0 2 5	42 78 0 39	24 2 2 0
12	33 63 8 60	29 5 1 9	43 17 0 44	22 2 1 8
22	42 23 9 58	27 6 1 4	43 61 0 46	20 4 1 6
Apr. 1	12 51 81 10 17	26 2 0 8	44 07 0 49	18 8 1 3
11	13 1 98 10 44	25 4 0 1	44 56 0 50	17 5 1 1
21	12 42 10 23	25 3 0 4	45 06 0 51	16 4 0 7
May 1	22 65 9 69	25 7 1 0	45 57 0 51	15 7 0 4
11	32 34 8 84	26 7 1 5	46 08 0 50	15 3 0 1
21	41 18 7 70	28 2 2 1	46 58 0 48	15 2 0 2
31	48 88 6 32	30 3 2 4	47 06 0 45	15 4 0 6
June 10	55 20 4 77	32 7 2 8	47 51 0 40	16 0 1 0
20	13 59 97 3 08	35 5 3 0	47 91 0 35	17 0 1 2
30	14 3 05 1 33	38 5 3 2	48 26 0 29	18 2 1 6
July 10	4 38 0 49	41 7 3 3	48 55 0 21	19 8 1 7
20	3 89 2 24	45 0 3 4	48 76 0 14	21 5 2 0
30	14 1 65 4 03	48 4 3 3	48 90 0 06	23 5 2 0
Aug. 9	13 57 62 5 60	51 7 3 1	48 96 0 02	25 5 2 1
19	52 02 7 20	54 8 3 0	48 94 0 09	27 6 2 1
29	44 82 8 65	51 57 8 2 7	48 85 0 16	29 7 1 9
Sept. 8	36 17 9 69	52 0 5 2 3	48 69 0 23	31 6 1 7
18	26 48 10 83	2 8 2 0	48 46 0 27	33 3 1 5
28	15 65 11 64	4 8 1 6	48 19 0 31	34 8 1 1
Oct. 8	13 4 01 12 21	6 4 1 1	47 88 0 33	35 9 0 8
18	12 51 80 12 51	7 5 0 6	47 55 0 33	36 7 0 3
28	39 29 12 56	8 1 0 1	47 22 0 31	37 0 0 1
Nov. 7	26 73 12 27	8 2 0 5	46 91 0 29	36 9 0 5
17	14 46 11 68	7 7 1 0	46 62 0 24	36 4 0 9
27	12 2 78 10 75	6 7 1 6	46 38 0 18	35 5 1 2
Dec. 7	11 52 03 9 48	5 1 2 0	46 20 0 12	34 3 1 6
17	42 55 7 98	3 1 2 5	46 08 0 05	32 7 1 9
27	34 57 6 14	52 0 6 2 9	46 03 0 01	30 8 2 1
37	11 28 43 51 57 7		13 46 04	12 28 7

APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ CYGNI.		$\beta^1$ CYGNI.		$\zeta$ CYGNI.	
	R. A.	Dec. North.	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 20 <sup>m</sup> 36	<sup>o</sup> 44 <sup>i</sup> 44	<sup>h</sup> 21 <sup>m</sup> 0	<sup>o</sup> 38 <sup>i</sup> 0	<sup>h</sup> 21 <sup>m</sup> 6	<sup>o</sup> 29 <sup>i</sup> 36
Jan. 1	17 <sup>s</sup> 37 <sup>s</sup> 0 <sup>s</sup> 06	57 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 9	8 <sup>s</sup> 93 <sup>s</sup> 0 <sup>s</sup> 06	60 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 4	31 <sup>s</sup> 70 <sup>s</sup> 0 <sup>s</sup> 05	58 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 3
11	17 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 01	54 <sup>s</sup> 7 <sup>s</sup> 3 <sup>s</sup> 0	8 <sup>s</sup> 87 <sup>s</sup> 0 <sup>s</sup> 00	58 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 7	31 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 01	55 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 4
21	17 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 06	51 <sup>s</sup> 7 <sup>s</sup> 3 <sup>s</sup> 4	8 <sup>s</sup> 87 <sup>s</sup> 0 <sup>s</sup> 03	55 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 6	31 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 03	53 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 4
31	17 <sup>s</sup> 36 <sup>s</sup> 0 <sup>s</sup> 09	48 <sup>s</sup> 3 <sup>s</sup> 2 <sup>s</sup> 9	8 <sup>s</sup> 90 <sup>s</sup> 0 <sup>s</sup> 08	53 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 9	31 <sup>s</sup> 67 <sup>s</sup> 0 <sup>s</sup> 07	51 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 6
Feb. 10	17 <sup>s</sup> 45 <sup>s</sup> 0 <sup>s</sup> 15	45 <sup>s</sup> 4 <sup>s</sup> 2 <sup>s</sup> 8	8 <sup>s</sup> 98 <sup>s</sup> 0 <sup>s</sup> 13	50 <sup>s</sup> 3 <sup>s</sup> 2 <sup>s</sup> 5	31 <sup>s</sup> 74 <sup>s</sup> 0 <sup>s</sup> 11	48 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 2
20	17 <sup>s</sup> 60 <sup>s</sup> 0 <sup>s</sup> 20	42 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 4	9 <sup>s</sup> 11 <sup>s</sup> 0 <sup>s</sup> 17	47 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 2	31 <sup>s</sup> 85 <sup>s</sup> 0 <sup>s</sup> 15	46 <sup>s</sup> 3 <sup>s</sup> 1 <sup>s</sup> 9
Mar. 2	17 <sup>s</sup> 80 <sup>s</sup> 0 <sup>s</sup> 24	40 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 0	9 <sup>s</sup> 28 <sup>s</sup> 0 <sup>s</sup> 21	45 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 8	32 <sup>s</sup> 00 <sup>s</sup> 0 <sup>s</sup> 18	44 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 6
12	18 <sup>s</sup> 04 <sup>s</sup> 0 <sup>s</sup> 27	38 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 6	9 <sup>s</sup> 49 <sup>s</sup> 0 <sup>s</sup> 24	43 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 3	32 <sup>s</sup> 18 <sup>s</sup> 0 <sup>s</sup> 21	42 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 2
22	18 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 31	36 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 0	9 <sup>s</sup> 73 <sup>s</sup> 0 <sup>s</sup> 28	42 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 9	32 <sup>s</sup> 39 <sup>s</sup> 0 <sup>s</sup> 25	41 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 7
Apr. 1	18 <sup>s</sup> 62 <sup>s</sup> 0 <sup>s</sup> 34	35 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 4	10 <sup>s</sup> 01 <sup>s</sup> 0 <sup>s</sup> 31	41 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 4	32 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 28	40 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 2
11	18 <sup>s</sup> 96 <sup>s</sup> 0 <sup>s</sup> 35	35 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 2	10 <sup>s</sup> 32 <sup>s</sup> 0 <sup>s</sup> 33	41 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 2	32 <sup>s</sup> 92 <sup>s</sup> 0 <sup>s</sup> 29	40 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 2
21	19 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 37	35 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 8	10 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 34	41 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 8	33 <sup>s</sup> 21 <sup>s</sup> 0 <sup>s</sup> 31	40 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 8
May 1	19 <sup>s</sup> 68 <sup>s</sup> 0 <sup>s</sup> 36	36 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 3	10 <sup>s</sup> 99 <sup>s</sup> 0 <sup>s</sup> 35	42 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 3	33 <sup>s</sup> 52 <sup>s</sup> 0 <sup>s</sup> 32	41 <sup>s</sup> 7 <sup>s</sup> 1 <sup>s</sup> 2
11	20 <sup>s</sup> 04 <sup>s</sup> 0 <sup>s</sup> 35	37 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 8	11 <sup>s</sup> 34 <sup>s</sup> 0 <sup>s</sup> 35	43 <sup>s</sup> 5 <sup>s</sup> 1 <sup>s</sup> 7	33 <sup>s</sup> 84 <sup>s</sup> 0 <sup>s</sup> 32	42 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 7
21	20 <sup>s</sup> 39 <sup>s</sup> 0 <sup>s</sup> 34	39 <sup>s</sup> 3 <sup>s</sup> 2 <sup>s</sup> 2	11 <sup>s</sup> 69 <sup>s</sup> 0 <sup>s</sup> 33	45 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 2	34 <sup>s</sup> 16 <sup>s</sup> 0 <sup>s</sup> 31	44 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 0
31	20 <sup>s</sup> 73 <sup>s</sup> 0 <sup>s</sup> 31	41 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 6	12 <sup>s</sup> 02 <sup>s</sup> 0 <sup>s</sup> 32	47 <sup>s</sup> 4 <sup>s</sup> 2 <sup>s</sup> 5	34 <sup>s</sup> 47 <sup>s</sup> 0 <sup>s</sup> 30	46 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 3
June 10	21 <sup>s</sup> 04 <sup>s</sup> 0 <sup>s</sup> 27	44 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 9	12 <sup>s</sup> 34 <sup>s</sup> 0 <sup>s</sup> 29	49 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 8	34 <sup>s</sup> 77 <sup>s</sup> 0 <sup>s</sup> 27	48 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 6
20	21 <sup>s</sup> 31 <sup>s</sup> 0 <sup>s</sup> 23	47 <sup>s</sup> 0 <sup>s</sup> 3 <sup>s</sup> 1	12 <sup>s</sup> 63 <sup>s</sup> 0 <sup>s</sup> 26	52 <sup>s</sup> 7 <sup>s</sup> 3 <sup>s</sup> 0	35 <sup>s</sup> 04 <sup>s</sup> 0 <sup>s</sup> 24	51 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 7
30	21 <sup>s</sup> 54 <sup>s</sup> 0 <sup>s</sup> 18	50 <sup>s</sup> 1 <sup>s</sup> 3 <sup>s</sup> 2	12 <sup>s</sup> 89 <sup>s</sup> 0 <sup>s</sup> 21	55 <sup>s</sup> 7 <sup>s</sup> 3 <sup>s</sup> 1	35 <sup>s</sup> 28 <sup>s</sup> 0 <sup>s</sup> 21	54 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 8
July 10	21 <sup>s</sup> 72 <sup>s</sup> 0 <sup>s</sup> 13	53 <sup>s</sup> 3 <sup>s</sup> 3 <sup>s</sup> 3	13 <sup>s</sup> 10 <sup>s</sup> 0 <sup>s</sup> 16	58 <sup>s</sup> 8 <sup>s</sup> 3 <sup>s</sup> 2	35 <sup>s</sup> 49 <sup>s</sup> 0 <sup>s</sup> 16	57 <sup>s</sup> 0 <sup>s</sup> 2 <sup>s</sup> 9
20	21 <sup>s</sup> 85 <sup>s</sup> 0 <sup>s</sup> 07	56 <sup>s</sup> 6 <sup>s</sup> 3 <sup>s</sup> 2	13 <sup>s</sup> 26 <sup>s</sup> 0 <sup>s</sup> 12	62 <sup>s</sup> 0 <sup>s</sup> 3 <sup>s</sup> 1	35 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 11	59 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 8
30	21 <sup>s</sup> 92 <sup>s</sup> 0 <sup>s</sup> 01	59 <sup>s</sup> 8 <sup>s</sup> 3 <sup>s</sup> 1	13 <sup>s</sup> 38 <sup>s</sup> 0 <sup>s</sup> 06	65 <sup>s</sup> 1 <sup>s</sup> 3 <sup>s</sup> 1	35 <sup>s</sup> 76 <sup>s</sup> 0 <sup>s</sup> 07	62 <sup>s</sup> 7 <sup>s</sup> 2 <sup>s</sup> 6
Aug. 9	21 <sup>s</sup> 93 <sup>s</sup> 0 <sup>s</sup> 04	62 <sup>s</sup> 9 <sup>s</sup> 3 <sup>s</sup> 0	13 <sup>s</sup> 44 <sup>s</sup> 0 <sup>s</sup> 01	68 <sup>s</sup> 2 <sup>s</sup> 2 <sup>s</sup> 9	35 <sup>s</sup> 83 <sup>s</sup> 0 <sup>s</sup> 02	65 <sup>s</sup> 3 <sup>s</sup> 2 <sup>s</sup> 5
19	21 <sup>s</sup> 89 <sup>s</sup> 0 <sup>s</sup> 10	65 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 7	13 <sup>s</sup> 45 <sup>s</sup> 0 <sup>s</sup> 04	71 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 7	35 <sup>s</sup> 85 <sup>s</sup> 0 <sup>s</sup> 03	67 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 3
29	21 <sup>s</sup> 79 <sup>s</sup> 0 <sup>s</sup> 14	68 <sup>s</sup> 6 <sup>s</sup> 2 <sup>s</sup> 4	13 <sup>s</sup> 41 <sup>s</sup> 0 <sup>s</sup> 08	73 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 5	35 <sup>s</sup> 82 <sup>s</sup> 0 <sup>s</sup> 07	70 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 1
Sept. 8	21 <sup>s</sup> 65 <sup>s</sup> 0 <sup>s</sup> 19	71 <sup>s</sup> 0 <sup>s</sup> 2 <sup>s</sup> 1	13 <sup>s</sup> 33 <sup>s</sup> 0 <sup>s</sup> 13	76 <sup>s</sup> 3 <sup>s</sup> 2 <sup>s</sup> 1	35 <sup>s</sup> 75 <sup>s</sup> 0 <sup>s</sup> 11	72 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 8
18	21 <sup>s</sup> 46 <sup>s</sup> 0 <sup>s</sup> 22	73 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 7	13 <sup>s</sup> 20 <sup>s</sup> 0 <sup>s</sup> 17	78 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 8	35 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 14	74 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 4
28	21 <sup>s</sup> 24 <sup>s</sup> 0 <sup>s</sup> 25	74 <sup>s</sup> 8 <sup>s</sup> 1 <sup>s</sup> 2	13 <sup>s</sup> 03 <sup>s</sup> 0 <sup>s</sup> 18	80 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 4	35 <sup>s</sup> 50 <sup>s</sup> 0 <sup>s</sup> 17	75 <sup>s</sup> 4 <sup>s</sup> 1 <sup>s</sup> 1
Oct. 8	20 <sup>s</sup> 99 <sup>s</sup> 0 <sup>s</sup> 27	76 <sup>s</sup> 0 <sup>s</sup> 0 <sup>s</sup> 8	12 <sup>s</sup> 85 <sup>s</sup> 0 <sup>s</sup> 21	81 <sup>s</sup> 6 <sup>s</sup> 0 <sup>s</sup> 9	35 <sup>s</sup> 33 <sup>s</sup> 0 <sup>s</sup> 19	76 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 7
18	20 <sup>s</sup> 72 <sup>s</sup> 0 <sup>s</sup> 27	76 <sup>s</sup> 8 <sup>s</sup> 0 <sup>s</sup> 3	12 <sup>s</sup> 64 <sup>s</sup> 0 <sup>s</sup> 22	82 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 6	35 <sup>s</sup> 14 <sup>s</sup> 0 <sup>s</sup> 19	77 <sup>s</sup> 2 <sup>s</sup> 0 <sup>s</sup> 3
28	20 <sup>s</sup> 45 <sup>s</sup> 0 <sup>s</sup> 27	77 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 2	12 <sup>s</sup> 42 <sup>s</sup> 0 <sup>s</sup> 22	83 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 0	34 <sup>s</sup> 95 <sup>s</sup> 0 <sup>s</sup> 20	77 <sup>s</sup> 5 <sup>s</sup> 0 <sup>s</sup> 1
Nov. 7	20 <sup>s</sup> 18 <sup>s</sup> 0 <sup>s</sup> 25	76 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 7	12 <sup>s</sup> 20 <sup>s</sup> 0 <sup>s</sup> 21	83 <sup>s</sup> 1 <sup>s</sup> 0 <sup>s</sup> 4	34 <sup>s</sup> 75 <sup>s</sup> 0 <sup>s</sup> 19	77 <sup>s</sup> 4 <sup>s</sup> 0 <sup>s</sup> 5
17	19 <sup>s</sup> 93 <sup>s</sup> 0 <sup>s</sup> 24	76 <sup>s</sup> 2 <sup>s</sup> 1 <sup>s</sup> 1	11 <sup>s</sup> 99 <sup>s</sup> 0 <sup>s</sup> 20	82 <sup>s</sup> 7 <sup>s</sup> 0 <sup>s</sup> 8	34 <sup>s</sup> 56 <sup>s</sup> 0 <sup>s</sup> 17	76 <sup>s</sup> 9 <sup>s</sup> 0 <sup>s</sup> 9
27	19 <sup>s</sup> 69 <sup>s</sup> 0 <sup>s</sup> 20	75 <sup>s</sup> 1 <sup>s</sup> 1 <sup>s</sup> 7	11 <sup>s</sup> 79 <sup>s</sup> 0 <sup>s</sup> 17	81 <sup>s</sup> 9 <sup>s</sup> 1 <sup>s</sup> 3	34 <sup>s</sup> 39 <sup>s</sup> 0 <sup>s</sup> 15	76 <sup>s</sup> 0 <sup>s</sup> 1 <sup>s</sup> 3
Dec. 7	19 <sup>s</sup> 49 <sup>s</sup> 0 <sup>s</sup> 17	73 <sup>s</sup> 4 <sup>s</sup> 2 <sup>s</sup> 1	11 <sup>s</sup> 62 <sup>s</sup> 0 <sup>s</sup> 14	80 <sup>s</sup> 6 <sup>s</sup> 1 <sup>s</sup> 7	34 <sup>s</sup> 24 <sup>s</sup> 0 <sup>s</sup> 13	74 <sup>s</sup> 7 <sup>s</sup> 1 <sup>s</sup> 6
17	19 <sup>s</sup> 32 <sup>s</sup> 0 <sup>s</sup> 13	71 <sup>s</sup> 3 <sup>s</sup> 2 <sup>s</sup> 5	11 <sup>s</sup> 48 <sup>s</sup> 0 <sup>s</sup> 11	78 <sup>s</sup> 9 <sup>s</sup> 2 <sup>s</sup> 1	34 <sup>s</sup> 11 <sup>s</sup> 0 <sup>s</sup> 10	73 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 0
27	19 <sup>s</sup> 19 <sup>s</sup> 0 <sup>s</sup> 08	68 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 7	11 <sup>s</sup> 37 <sup>s</sup> 0 <sup>s</sup> 07	76 <sup>s</sup> 8 <sup>s</sup> 2 <sup>s</sup> 3	34 <sup>s</sup> 01 <sup>s</sup> 0 <sup>s</sup> 06	71 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 1
37	19 <sup>s</sup> 11 <sup>s</sup> 0 <sup>s</sup> 08	66 <sup>s</sup> 1 <sup>s</sup> 2 <sup>s</sup> 7	11 <sup>s</sup> 30 <sup>s</sup> 0 <sup>s</sup> 07	74 <sup>s</sup> 5 <sup>s</sup> 2 <sup>s</sup> 3	33 <sup>s</sup> 95 <sup>s</sup> 0 <sup>s</sup> 06	69 <sup>s</sup> 0 <sup>s</sup> 2 <sup>s</sup> 1



APPARENT PLACES OF THE PRINCIPAL FIXED STARS  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	$\alpha$ CEPHEI.		$\beta$ AQUARI.		$\beta$ CEPHEI.	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec.
	<sup>h</sup> 21 <sup>m</sup> 14	<sup>o</sup> 61 <sup>i</sup> 56	<sup>h</sup> 21 <sup>m</sup> 23	<sup>o</sup> 6 <sup>i</sup> 13	<sup>h</sup> 21 <sup>m</sup> 26	<sup>o</sup> 69
Jan. 1	57° 96' 0" 21	77° 5' 2" 18	37° 83' 0" 03	42° 5' 0" 06	40° 37' 0" 36	84° 1'
11	57° 75' 0" 15	74° 7' 3" 0	37° 80' 0" 01	43° 1' 0" 6	40° 01' 0" 27	81° 1'
21	57° 60' 0" 06	71° 7' 3" 3	37° 81' 0" 04	43° 7' 0" 5	39° 74' 0" 16	78° 1'
31	57° 54' 0" 02	68° 4' 3" 6	37° 85' 0" 07	44° 2' 0" 4	39° 58' 0" 04	75° 1'
Feb. 10	57° 56' 0" 10	64° 8' 3" 2	37° 92' 0" 12	44° 6' 0" 2	39° 54' 0" 08	72° 1'
20	57° 66' 0" 18	61° 6' 3" 0	38° 04' 0" 13	44° 8' 0" 0	39° 62' 0" 19	68° 1'
Mar. 2	57° 84' 0" 26	58° 6' 2" 7	38° 17' 0" 16	44° 8' 0" 2	39° 81' 0" 31	65° 1'
12	58° 10' 0" 33	55° 9' 2" 2	38° 33' 0" 20	44° 6' 0" 4	40° 12' 0" 40	62° 1'
22	58° 43' 0" 39	53° 7' 1" 7	38° 53' 0" 22	44° 2' 0" 7	40° 52' 0" 49	60° 1'
Apr. 1	58° 82' 0" 44	52° 0' 1" 2	38° 75' 0" 24	43° 5' 1" 0	41° 01' 0" 56	58° 1'
11	59° 26' 0" 48	50° 8' 0" 6	38° 99' 0" 27	42° 5' 1" 1	41° 57' 0" 62	56° 1'
21	59° 74' 0" 50	50° 2' 0" 1	39° 26' 0" 28	41° 4' 1" 3	42° 19' 0" 65	55° 1'
May 1	60° 24' 0" 52	50° 3' 0" 7	39° 54' 0" 30	40° 1' 1" 5	42° 84' 0" 67	55° 1'
11	60° 76' 0" 50	51° 0' 1" 2	39° 84' 0" 30	38° 6' 1" 6	43° 51' 0" 67	55° 1'
21	61° 26' 0" 49	52° 2' 1" 8	40° 14' 0" 31	37° 0' 1" 7	44° 18' 0" 63	56° 1'
31	61° 75' 0" 45	54° 0' 2" 3	40° 45' 0" 29	35° 3' 1" 7	44° 81' 0" 59	58° 1'
June 10	62° 20' 0" 40	56° 3' 2" 7	40° 74' 0" 28	33° 6' 1" 6	45° 40' 0" 53	60° 1'
20	62° 60' 0" 35	59° 0' 3" 0	41° 02' 0" 26	32° 0' 1" 6	45° 93' 0" 46	63° 1'
30	62° 95' 0" 28	62° 0' 3" 3	41° 28' 0" 23	30° 4' 1" 4	46° 39' 0" 37	66° 1'
July 10	63° 23' 0" 20	65° 3' 3" 5	41° 51' 0" 19	29° 0' 1" 3	46° 76' 0" 27	69° 1'
20	63° 43' 0" 13	68° 8' 3" 5	41° 70' 0" 15	27° 7' 1" 1	47° 03' 0" 17	72° 1'
30	63° 56' 0" 05	72° 3' 3" 6	41° 85' 0" 10	26° 6' 0" 9	47° 20' 0" 06	76° 1'
Aug. 9	63° 61' 0" 04	75° 9' 3" 5	41° 95' 0" 06	25° 7' 0" 7	47° 26' 0" 04	79° 1'
19	63° 57' 0" 11	79° 4' 3" 3	42° 01' 0" 02	25° 0' 0" 5	47° 22' 0" 15	83° 1'
29	63° 46' 0" 18	82° 7' 3" 1	42° 03' 0" 02	24° 5' 0" 2	47° 07' 0" 24	86° 1'
Sept. 8	63° 28' 0" 25	85° 8' 2" 9	42° 01' 0" 06	24° 3' 0" 1	46° 83' 0" 34	90° 1'
18	63° 03' 0" 31	88° 7' 2" 5	41° 95' 0" 10	24° 2' 0" 0	46° 49' 0" 41	93° 1'
28	62° 72' 0" 36	91° 2' 2" 1	41° 85' 0" 12	24° 2' 0" 3	46° 08' 0" 49	96° 1'
Oct. 8	62° 36' 0" 39	93° 3' 1" 6	41° 73' 0" 14	24° 5' 0" 3	45° 59' 0" 55	98° 1'
18	61° 97' 0" 42	94° 9' 1" 1	41° 59' 0" 15	24° 8' 0" 5	45° 04' 0" 58	100° 1'
28	61° 55' 0" 43	96° 0' 0" 6	41° 44' 0" 15	25° 3' 0" 5	44° 46' 0" 61	101° 1'
Nov. 7	61° 12' 0" 43	96° 6' 0" 0	41° 29' 0" 14	25° 8' 0" 6	43° 85' 0" 62	102° 1'
17	60° 69' 0" 42	96° 6' 0" 5	41° 15' 0" 13	26° 4' 0" 7	43° 23' 0" 61	103° 1'
27	60° 27' 0" 39	96° 1' 1" 1	41° 02' 0" 11	27° 1' 0" 7	42° 62' 0" 58	102° 1'
Dec. 7	59° 88' 0" 36	95° 0' 1" 7	40° 91' 0" 09	27° 8' 0" 7	42° 04' 0" 54	102° 1'
17	59° 52' 0" 30	93° 3' 2" 1	40° 82' 0" 06	28° 5' 0" 7	41° 50' 0" 48	100° 1'
27	59° 22' 0" 26	91° 2' 2" 6	40° 76' 0" 03	29° 2' 0" 7	41° 02' 0" 41	98° 1'
37	58° 96' 0" 26	88° 6' 2" 6	40° 73' 0" 03	29° 9' 0" 7	40° 61' 0" 41	96° 1'



## APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	ε Pegasi.			α AQUARI.				α GRUIS.			
	R. A.		Dec. North.	R. A.		Dec. South.		R. A.		Dec. South.	
	<sup>h</sup> 21	<sup>m</sup> 36	<sup>o</sup> 9 <sup>i</sup> 11	<sup>h</sup> 21	<sup>m</sup> 58	<sup>o</sup> 1 <sup>i</sup> 2		<sup>h</sup> 21	<sup>m</sup> 58	<sup>o</sup> 47 <sup>i</sup> 40	
Jan. 1	47° 65'	<sup>s</sup> 0° 04'	25° 4'	3° 13'	<sup>s</sup> 0° 05'	48° 6'	<sup>s</sup> 0° 08'	42° 83'	<sup>s</sup> 0° 09'	74° 7'	<sup>s</sup> 1° 3'
11	47° 61'	<sup>s</sup> 0° 01'	24° 0'	3° 08'	<sup>s</sup> 0° 02'	49° 4'	<sup>s</sup> 0° 08'	42° 74'	<sup>s</sup> 0° 05'	73° 4'	<sup>s</sup> 1° 7'
21	47° 60'	<sup>s</sup> 0° 01'	22° 6'	3° 06'	<sup>s</sup> 0° 00'	50° 2'	<sup>s</sup> 0° 08'	42° 69'	<sup>s</sup> 0° 00'	71° 7'	<sup>s</sup> 1° 9'
31	47° 61'	<sup>s</sup> 0° 05'	21° 3'	3° 06'	<sup>s</sup> 0° 03'	51° 0'	<sup>s</sup> 0° 6'	42° 69'	<sup>s</sup> 0° 05'	69° 8'	<sup>s</sup> 2° 2'
Feb. 10	47° 66'	<sup>s</sup> 0° 09'	20° 0'	3° 09'	<sup>s</sup> 0° 07'	51° 6'	<sup>s</sup> 0° 5'	42° 74'	<sup>s</sup> 0° 10'	67° 6'	<sup>s</sup> 2° 5'
20	47° 75'	<sup>s</sup> 0° 12'	18° 8'	3° 16'	<sup>s</sup> 0° 10'	52° 1'	<sup>s</sup> 0° 3'	42° 84'	<sup>s</sup> 0° 14'	65° 1'	<sup>s</sup> 2° 4'
Mar. 2	47° 87'	<sup>s</sup> 0° 14'	17° 9'	3° 26'	<sup>s</sup> 0° 13'	52° 4'	<sup>s</sup> 0° 0'	42° 98'	<sup>s</sup> 0° 19'	62° 7'	<sup>s</sup> 2° 5'
12	48° 01'	<sup>s</sup> 0° 18'	17° 3'	3° 39'	<sup>s</sup> 0° 16'	52° 4'	<sup>s</sup> 0° 3'	43° 17'	<sup>s</sup> 0° 23'	60° 2'	<sup>s</sup> 2° 5'
22	48° 19'	<sup>s</sup> 0° 21'	17° 0'	3° 55'	<sup>s</sup> 0° 19'	52° 1'	<sup>s</sup> 0° 5'	43° 40'	<sup>s</sup> 0° 27'	57° 7'	<sup>s</sup> 2° 4'
Apr. 1	48° 40'	<sup>s</sup> 0° 24'	17° 0'	3° 74'	<sup>s</sup> 0° 22'	51° 6'	<sup>s</sup> 0° 8'	43° 67'	<sup>s</sup> 0° 31'	55° 3'	<sup>s</sup> 2° 4'
11	48° 64'	<sup>s</sup> 0° 26'	17° 4'	3° 96'	<sup>s</sup> 0° 25'	50° 8'	<sup>s</sup> 1° 0'	43° 98'	<sup>s</sup> 0° 35'	52° 9'	<sup>s</sup> 2° 2'
21	48° 90'	<sup>s</sup> 0° 28'	18° 1'	4° 21'	<sup>s</sup> 0° 27'	49° 8'	<sup>s</sup> 1° 3'	44° 33'	<sup>s</sup> 0° 38'	50° 7'	<sup>s</sup> 2° 1'
May 1	49° 18'	<sup>s</sup> 0° 29'	19° 2'	4° 48'	<sup>s</sup> 0° 29'	48° 5'	<sup>s</sup> 1° 5'	44° 71'	<sup>s</sup> 0° 40'	48° 6'	<sup>s</sup> 1° 8'
11	49° 47'	<sup>s</sup> 0° 30'	20° 6'	4° 77'	<sup>s</sup> 0° 30'	47° 0'	<sup>s</sup> 1° 7'	45° 11'	<sup>s</sup> 0° 41'	46° 8'	<sup>s</sup> 1° 6'
21	49° 77'	<sup>s</sup> 0° 30'	22° 2'	5° 07'	<sup>s</sup> 0° 30'	45° 3'	<sup>s</sup> 1° 8'	45° 52'	<sup>s</sup> 0° 43'	45° 2'	<sup>s</sup> 1° 2'
31	50° 07'	<sup>s</sup> 0° 30'	24° 0'	5° 37'	<sup>s</sup> 0° 30'	43° 5'	<sup>s</sup> 1° 8'	45° 95'	<sup>s</sup> 0° 42'	44° 0'	<sup>s</sup> 0° 9'
June 10	50° 37'	<sup>s</sup> 0° 27'	26° 0'	5° 67'	<sup>s</sup> 0° 29'	41° 7'	<sup>s</sup> 1° 9'	46° 37'	<sup>s</sup> 0° 41'	43° 1'	<sup>s</sup> 0° 5'
20	50° 64'	<sup>s</sup> 0° 26'	28° 1'	5° 96'	<sup>s</sup> 0° 28'	39° 8'	<sup>s</sup> 1° 8'	46° 78'	<sup>s</sup> 0° 38'	42° 6'	<sup>s</sup> 0° 1'
30	50° 90'	<sup>s</sup> 0° 23'	30° 2'	6° 24'	<sup>s</sup> 0° 24'	38° 0'	<sup>s</sup> 1° 8'	47° 16'	<sup>s</sup> 0° 35'	42° 5'	<sup>s</sup> 0° 3'
July 10	51° 13'	<sup>s</sup> 0° 19'	32° 4'	6° 48'	<sup>s</sup> 0° 22'	36° 2'	<sup>s</sup> 1° 6'	47° 51'	<sup>s</sup> 0° 31'	42° 8'	<sup>s</sup> 0° 6'
20	51° 32'	<sup>s</sup> 0° 15'	34° 4'	6° 70'	<sup>s</sup> 0° 17'	34° 6'	<sup>s</sup> 1° 5'	47° 82'	<sup>s</sup> 0° 25'	43° 4'	<sup>s</sup> 1° 0'
30	51° 47'	<sup>s</sup> 0° 11'	36° 3'	6° 87'	<sup>s</sup> 0° 14'	33° 1'	<sup>s</sup> 1° 2'	48° 07'	<sup>s</sup> 0° 20'	44° 4'	<sup>s</sup> 1° 3'
Aug. 9	51° 58'	<sup>s</sup> 0° 07'	38° 1'	7° 01'	<sup>s</sup> 0° 09'	31° 9'	<sup>s</sup> 1° 1'	48° 27'	<sup>s</sup> 0° 13'	45° 7'	<sup>s</sup> 1° 6'
19	51° 65'	<sup>s</sup> 0° 02'	39° 7'	7° 10'	<sup>s</sup> 0° 05'	30° 8'	<sup>s</sup> 0° 8'	48° 40'	<sup>s</sup> 0° 07'	47° 3'	<sup>s</sup> 1° 8'
29	51° 67'	<sup>s</sup> 0° 02'	41° 1'	7° 15'	<sup>s</sup> 0° 00'	30° 0'	<sup>s</sup> 0° 6'	48° 47'	<sup>s</sup> 0° 01'	49° 1'	<sup>s</sup> 1° 9'
Sept. 8	51° 65'	<sup>s</sup> 0° 05'	42° 2'	7° 15'	<sup>s</sup> 0° 03'	29° 4'	<sup>s</sup> 0° 4'	48° 48'	<sup>s</sup> 0° 05'	51° 0'	<sup>s</sup> 2° 0'
18	51° 60'	<sup>s</sup> 0° 09'	43° 1'	7° 12'	<sup>s</sup> 0° 07'	29° 0'	<sup>s</sup> 0° 2'	48° 43'	<sup>s</sup> 0° 11'	53° 0'	<sup>s</sup> 2° 0'
28	51° 51'	<sup>s</sup> 0° 12'	43° 8'	7° 05'	<sup>s</sup> 0° 09'	28° 8'	<sup>s</sup> 0° 0'	48° 32'	<sup>s</sup> 0° 15'	55° 0'	<sup>s</sup> 1° 8'
Oct. 8	51° 39'	<sup>s</sup> 0° 13'	44° 2'	6° 96'	<sup>s</sup> 0° 12'	28° 8'	<sup>s</sup> 0° 2'	48° 17'	<sup>s</sup> 0° 19'	56° 8'	<sup>s</sup> 1° 7'
18	51° 26'	<sup>s</sup> 0° 15'	44° 4'	6° 84'	<sup>s</sup> 0° 13'	29° 0'	<sup>s</sup> 0° 3'	47° 98'	<sup>s</sup> 0° 22'	58° 5'	<sup>s</sup> 1° 4'
28	51° 11'	<sup>s</sup> 0° 15'	44° 4'	6° 71'	<sup>s</sup> 0° 14'	29° 3'	<sup>s</sup> 0° 4'	47° 76'	<sup>s</sup> 0° 24'	59° 9'	<sup>s</sup> 1° 1'
Nov. 7	50° 96'	<sup>s</sup> 0° 15'	44° 1'	6° 57'	<sup>s</sup> 0° 14'	29° 7'	<sup>s</sup> 0° 6'	47° 52'	<sup>s</sup> 0° 23'	61° 0'	<sup>s</sup> 0° 7'
17	50° 81'	<sup>s</sup> 0° 14'	43° 6'	6° 43'	<sup>s</sup> 0° 13'	30° 3'	<sup>s</sup> 0° 7'	47° 38'	<sup>s</sup> 0° 22'	61° 7'	<sup>s</sup> 0° 4'
27	50° 67'	<sup>s</sup> 0° 12'	42° 9'	6° 30'	<sup>s</sup> 0° 12'	31° 0'	<sup>s</sup> 0° 7'	47° 07'	<sup>s</sup> 0° 21'	62° 1'	<sup>s</sup> 0° 1'
Dec. 7	50° 55'	<sup>s</sup> 0° 10'	42° 0'	6° 18'	<sup>s</sup> 0° 11'	31° 7'	<sup>s</sup> 0° 8'	46° 86'	<sup>s</sup> 0° 18'	62° 0'	<sup>s</sup> 0° 4'
17	50° 45'	<sup>s</sup> 0° 08'	40° 9'	6° 07'	<sup>s</sup> 0° 08'	32° 5'	<sup>s</sup> 0° 9'	46° 68'	<sup>s</sup> 0° 14'	61° 6'	<sup>s</sup> 0° 3'
27	50° 37'	<sup>s</sup> 0° 05'	39° 7'	5° 99'	<sup>s</sup> 0° 06'	33° 4'	<sup>s</sup> 0° 9'	46° 54'	<sup>s</sup> 0° 11'	60° 8'	<sup>s</sup> 1° 2'
37	50° 32'		38° 4'	5° 93'		34° 3'		46° 43'		59° 6'	



APPARENT PLACES OF THE PRINCIPAL FIXED STARS,  
FOR THE UPPER TRANSIT AT GREENWICH.

Day of the Month.	ζ Pegasi.		α PISCIS AUSTRALIS. (Fomalhaut)		α PEGASI. (Markab)	
	R. A.	Dec. North.	R. A.	Dec. South.	R. A.	Dec. North.
	<sup>h</sup> 22 <sup>m</sup> 33	<sup>°</sup> 10 <sup>'</sup> 2	<sup>h</sup> 22 <sup>m</sup> 49	<sup>°</sup> 30 <sup>'</sup> 24	<sup>h</sup> 22 <sup>m</sup> 57	<sup>°</sup> 14 <sup>'</sup> 2
Jan. 1	57 <sup>s</sup> .68	60 <sup>s</sup> .5	19 <sup>s</sup> .33	67 <sup>s</sup> .6	16 <sup>s</sup> .45	59 <sup>s</sup> .1
11	57 <sup>s</sup> .60	59 <sup>s</sup> .3	19 <sup>s</sup> .23	67 <sup>s</sup> .2	16 <sup>s</sup> .35	57 <sup>s</sup> .9
21	57 <sup>s</sup> .54	58 <sup>s</sup> .1	19 <sup>s</sup> .16	66 <sup>s</sup> .6	16 <sup>s</sup> .26	56 <sup>s</sup> .6
31	57 <sup>s</sup> .51	56 <sup>s</sup> .8	19 <sup>s</sup> .11	65 <sup>s</sup> .7	16 <sup>s</sup> .21	55 <sup>s</sup> .2
	0 <sup>s</sup> .01	1 <sup>s</sup> .1	0 <sup>s</sup> .02	1 <sup>s</sup> .1	0 <sup>s</sup> .04	1 <sup>s</sup> .1
Feb. 10	57 <sup>s</sup> .50	55 <sup>s</sup> .7	19 <sup>s</sup> .09	64 <sup>s</sup> .6	16 <sup>s</sup> .17	53 <sup>s</sup> .9
20	57 <sup>s</sup> .52	54 <sup>s</sup> .6	19 <sup>s</sup> .11	63 <sup>s</sup> .2	16 <sup>s</sup> .17	52 <sup>s</sup> .7
Mar. 2	57 <sup>s</sup> .58	53 <sup>s</sup> .6	19 <sup>s</sup> .16	61 <sup>s</sup> .6	16 <sup>s</sup> .20	51 <sup>s</sup> .6
12	57 <sup>s</sup> .67	53 <sup>s</sup> .0	19 <sup>s</sup> .26	59 <sup>s</sup> .6	16 <sup>s</sup> .27	50 <sup>s</sup> .6
	0 <sup>s</sup> .13	0 <sup>s</sup> .3	0 <sup>s</sup> .13	1 <sup>s</sup> .9	0 <sup>s</sup> .10	0 <sup>s</sup> .0
22	57 <sup>s</sup> .80	52 <sup>s</sup> .7	19 <sup>s</sup> .39	57 <sup>s</sup> .7	16 <sup>s</sup> .37	50 <sup>s</sup> .0
Apr. 1	57 <sup>s</sup> .96	52 <sup>s</sup> .6	19 <sup>s</sup> .56	55 <sup>s</sup> .6	16 <sup>s</sup> .51	49 <sup>s</sup> .7
11	58 <sup>s</sup> .15	52 <sup>s</sup> .9	19 <sup>s</sup> .76	53 <sup>s</sup> .5	16 <sup>s</sup> .69	49 <sup>s</sup> .7
21	58 <sup>s</sup> .38	53 <sup>s</sup> .5	20 <sup>s</sup> .00	51 <sup>s</sup> .3	16 <sup>s</sup> .90	50 <sup>s</sup> .1
	0 <sup>s</sup> .26	0 <sup>s</sup> .9	0 <sup>s</sup> .28	2 <sup>s</sup> .2	0 <sup>s</sup> .25	0 <sup>s</sup> .0
May 1	58 <sup>s</sup> .64	54 <sup>s</sup> .4	20 <sup>s</sup> .28	49 <sup>s</sup> .1	17 <sup>s</sup> .15	50 <sup>s</sup> .8
11	58 <sup>s</sup> .92	55 <sup>s</sup> .7	20 <sup>s</sup> .58	46 <sup>s</sup> .9	17 <sup>s</sup> .42	51 <sup>s</sup> .9
21	59 <sup>s</sup> .21	57 <sup>s</sup> .2	20 <sup>s</sup> .90	44 <sup>s</sup> .8	17 <sup>s</sup> .71	53 <sup>s</sup> .2
31	59 <sup>s</sup> .52	59 <sup>s</sup> .0	21 <sup>s</sup> .24	42 <sup>s</sup> .9	18 <sup>s</sup> .02	54 <sup>s</sup> .9
	0 <sup>s</sup> .30	1 <sup>s</sup> .9	0 <sup>s</sup> .35	1 <sup>s</sup> .7	0 <sup>s</sup> .31	1 <sup>s</sup> .1
June 10	59 <sup>s</sup> .82	60 <sup>s</sup> .9	21 <sup>s</sup> .59	41 <sup>s</sup> .2	18 <sup>s</sup> .33	56 <sup>s</sup> .8
20	60 <sup>s</sup> .13	63 <sup>s</sup> .0	21 <sup>s</sup> .94	39 <sup>s</sup> .8	18 <sup>s</sup> .61	58 <sup>s</sup> .8
30	60 <sup>s</sup> .41	65 <sup>s</sup> .1	22 <sup>s</sup> .27	38 <sup>s</sup> .6	18 <sup>s</sup> .94	61 <sup>s</sup> .0
July 10	60 <sup>s</sup> .68	67 <sup>s</sup> .3	22 <sup>s</sup> .59	37 <sup>s</sup> .8	19 <sup>s</sup> .22	63 <sup>s</sup> .2
	0 <sup>s</sup> .23	2 <sup>s</sup> .1	0 <sup>s</sup> .29	0 <sup>s</sup> .5	0 <sup>s</sup> .25	2 <sup>s</sup> .1
20	60 <sup>s</sup> .91	69 <sup>s</sup> .4	22 <sup>s</sup> .88	37 <sup>s</sup> .3	19 <sup>s</sup> .47	65 <sup>s</sup> .5
30	61 <sup>s</sup> .12	71 <sup>s</sup> .4	23 <sup>s</sup> .13	37 <sup>s</sup> .1	19 <sup>s</sup> .69	67 <sup>s</sup> .7
Aug. 9	61 <sup>s</sup> .28	73 <sup>s</sup> .3	23 <sup>s</sup> .34	37 <sup>s</sup> .3	19 <sup>s</sup> .87	69 <sup>s</sup> .8
19	61 <sup>s</sup> .40	75 <sup>s</sup> .0	23 <sup>s</sup> .51	37 <sup>s</sup> .8	20 <sup>s</sup> .02	71 <sup>s</sup> .8
	0 <sup>s</sup> .08	1 <sup>s</sup> .6	0 <sup>s</sup> .11	0 <sup>s</sup> .8	0 <sup>s</sup> .10	1 <sup>s</sup> .1
29	61 <sup>s</sup> .48	76 <sup>s</sup> .6	23 <sup>s</sup> .62	38 <sup>s</sup> .6	20 <sup>s</sup> .12	73 <sup>s</sup> .6
Sept. 8	61 <sup>s</sup> .52	77 <sup>s</sup> .9	23 <sup>s</sup> .69	39 <sup>s</sup> .6	20 <sup>s</sup> .18	75 <sup>s</sup> .1
18	61 <sup>s</sup> .51	79 <sup>s</sup> .0	23 <sup>s</sup> .71	40 <sup>s</sup> .8	20 <sup>s</sup> .20	76 <sup>s</sup> .5
28	61 <sup>s</sup> .48	79 <sup>s</sup> .8	23 <sup>s</sup> .68	42 <sup>s</sup> .2	20 <sup>s</sup> .18	77 <sup>s</sup> .6
	0 <sup>s</sup> .07	0 <sup>s</sup> .6	0 <sup>s</sup> .06	1 <sup>s</sup> .5	0 <sup>s</sup> .05	0 <sup>s</sup> .0
Oct. 8	61 <sup>s</sup> .41	80 <sup>s</sup> .4	23 <sup>s</sup> .62	43 <sup>s</sup> .7	20 <sup>s</sup> .13	78 <sup>s</sup> .5
18	61 <sup>s</sup> .31	80 <sup>s</sup> .8	23 <sup>s</sup> .52	45 <sup>s</sup> .1	20 <sup>s</sup> .05	79 <sup>s</sup> .1
28	61 <sup>s</sup> .20	80 <sup>s</sup> .9	23 <sup>s</sup> .40	46 <sup>s</sup> .5	19 <sup>s</sup> .95	79 <sup>s</sup> .5
Nov. 7	61 <sup>s</sup> .07	80 <sup>s</sup> .8	23 <sup>s</sup> .25	47 <sup>s</sup> .8	19 <sup>s</sup> .83	79 <sup>s</sup> .6
	0 <sup>s</sup> .14	0 <sup>s</sup> .3	0 <sup>s</sup> .15	1 <sup>s</sup> .1	0 <sup>s</sup> .13	0 <sup>s</sup> .0
17	60 <sup>s</sup> .93	80 <sup>s</sup> .5	23 <sup>s</sup> .10	48 <sup>s</sup> .9	19 <sup>s</sup> .70	79 <sup>s</sup> .5
27	60 <sup>s</sup> .80	79 <sup>s</sup> .9	22 <sup>s</sup> .91	49 <sup>s</sup> .8	19 <sup>s</sup> .57	79 <sup>s</sup> .1
Dec. 7	60 <sup>s</sup> .67	79 <sup>s</sup> .2	22 <sup>s</sup> .79	50 <sup>s</sup> .5	19 <sup>s</sup> .44	78 <sup>s</sup> .5
17	60 <sup>s</sup> .55	78 <sup>s</sup> .4	22 <sup>s</sup> .65	50 <sup>s</sup> .8	19 <sup>s</sup> .32	77 <sup>s</sup> .7
	0 <sup>s</sup> .10	1 <sup>s</sup> .1	0 <sup>s</sup> .13	0 <sup>s</sup> .1	0 <sup>s</sup> .12	0 <sup>s</sup> .0
27	60 <sup>s</sup> .45	77 <sup>s</sup> .3	22 <sup>s</sup> .52	50 <sup>s</sup> .9	19 <sup>s</sup> .20	76 <sup>s</sup> .8
37	60 <sup>s</sup> .36	76 <sup>s</sup> .2	22 <sup>s</sup> .42	50 <sup>s</sup> .7	19 <sup>s</sup> .09	75 <sup>s</sup> .6

## APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT GREENWICH.

Day the month.	♑ Piscium.		γ Cephei.	
	R. A.	Dec. North.	R. A.	Dec. North.
	<sup>h</sup> 23 <sup>m</sup>	<sup>o</sup> 4	<sup>h</sup> 23 <sup>m</sup>	<sup>o</sup> 76
a. 1	32 13.24 0.10	48 46.6 0.8	33 14.14 0.85	47 59.2 1.0
11	13.14 0.10	45.8 0.9	13.29 0.79	58.2 1.6
21	13.04 0.07	44.9 0.9	12.50 0.70	56.6 2.1
31	12.97 0.06	44.0 0.8	11.80 0.58	54.5 2.5
b. 10	12.91 0.03	43.2 0.6	11.22 0.44	52.0 2.9
20	12.88 0.00	42.6 0.5	10.78 0.27	49.1 3.1
ar. 2	12.88 0.03	42.1 0.3	10.51 0.10	46.0 3.2
12	12.91 0.07	41.8 0.1	10.41 0.10	42.8 3.4
22	12.98 0.11	41.7 0.2	10.51 0.27	39.4 2.9
or. 1	13.09 0.14	41.9 0.5	10.78 0.45	36.5 2.6
11	13.23 0.18	42.4 0.8	11.23 0.59	33.9 2.3
21	13.41 0.22	43.2 1.0	11.82 0.73	31.6 1.8
ay 1	13.63 0.25	44.2 1.3	12.55 0.83	29.8 1.3
11	13.88 0.28	45.5 1.5	13.38 0.92	28.5 0.7
21	14.16 0.29	47.0 1.8	14.30 0.96	27.8 0.1
31	14.45 0.30	48.8 1.9	15.26 0.99	27.7 0.4
ne 10	14.75 0.31	50.7 2.0	16.25 0.98	28.1 1.0
20	15.06 0.31	52.7 2.0	17.23 0.94	29.1 1.6
30	15.37 0.29	54.7 2.0	18.17 0.88	30.7 2.0
ly 10	15.66 0.27	56.7 2.0	19.05 0.80	32.7 2.5
20	15.93 0.25	48 58.7 1.8	19.85 0.70	35.2 2.9
30	16.18 0.21	49 0.5 1.7	20.55 0.58	38.1 3.2
ig. 9	16.39 0.18	2.2 1.5	21.13 0.46	41.3 3.4
19	16.57 0.13	3.7 1.3	21.59 0.32	44.7 3.6
29	16.70 0.10	5.0 1.0	21.91 0.18	48.3 3.7
pt. 8	16.80 0.06	6.0 0.9	22.09 0.03	52.0 3.7
18	16.86 0.02	6.9 0.6	22.12 0.10	55.7 3.7
28	16.88 0.01	7.5 0.3	22.02 0.24	47 59.4 3.6
st. 8	16.87 0.04	7.8 0.2	21.78 0.38	48 3.0 3.3
18	16.83 0.07	8.0 0.1	21.40 0.50	6.3 3.1
28	16.76 0.09	7.9 0.2	20.90 0.60	9.4 2.6
ov. 7	16.67 0.10	7.7 0.4	20.30 0.71	12.0 2.2
17	16.57 0.11	7.3 0.5	19.59 0.79	14.2 1.8
27	16.46 0.11	6.8 0.7	18.80 0.85	16.0 1.1
ec. 7	16.35 0.12	6.1 0.7	17.95 0.89	17.1 0.6
17	16.23 0.12	5.4 0.8	17.06 0.89	17.7 0.1
27	16.11 0.10	4.6 0.8	16.17 0.88	17.6 0.6
37	32 16.01 0.10	49 3.8 0.8	33 15.29 0.88	48 17.0 0.6



TABLE,

Showing the *Correction* to be applied to the *preceding* Apparent Places of *F* Polar Stars, for the terms of Nutation involving  $2\epsilon$ .

Arg.		$\alpha$ Urs. Min.		51 Cephei.		$\sigma$ Octantis.		$\delta$ Urs. Min.		$\lambda$ Urs. Min.		°
$\epsilon$		R. A.	Dec.	R. A.	Dec.	R. A.	Dec.	R. A.	Dec.	R. A.	Dec.	
0	180	—'211	+ '02	+ '011	+ '09	—'114	— '09	— '011	— '09	— '168	— '07	90
1	181	'213	'02	'007	'09	'129	'09	'008	'09	'161	'07	91
2	182	'215	'02	+ '002	'09	'144	'09	'006	'09	'154	'08	92
3	183	'217	'02	— '002	'09	'157	'09	'003	'09	'147	'08	93
4	184	'218	'01	'007	'09	'172	'08	— '000	'09	'139	'08	94
5	185	'219	'01	'011	'09	'186	'08	+ '003	'09	'131	'08	95
6	186	'220	'01	'016	'09	'200	'08	'005	'09	'123	'08	96
7	187	'221	'00	'020	'09	'214	'08	'008	'09	'116	'08	97
8	188	'221	'00	'025	'09	'227	'08	'011	'09	'107	'08	98
9	189	'221	'00	'030	'09	'239	'08	'014	'09	'100	'08	99
10	190	'220	+ '00	'034	'09	'252	'08	'017	'09	'091	'08	100
11	191	'220	— '01	'038	'09	'265	'07	'019	'09	'083	'09	101
12	192	'219	'01	'042	'09	'277	'07	'022	'09	'074	'09	102
13	193	'218	'01	'046	'08	'288	'07	'024	'08	'065	'09	103
14	194	'216	'02	'050	'08	'300	'07	'027	'08	'056	'09	104
15	195	'215	'02	'055	'08	'311	'07	'029	'08	'047	'09	105
16	196	'213	'02	'059	'08	'322	'06	'032	'08	'039	'09	106
17	197	'211	'02	'063	'08	'332	'06	'035	'08	'030	'09	107
18	198	'209	'03	'066	'08	'341	'06	'037	'08	'021	'09	108
19	199	'206	'03	'070	'08	'351	'06	'039	'08	'012	'09	109
20	200	'204	'03	'074	'07	'360	'05	'042	'07	— '004	'09	110
21	201	'200	'03	'078	'07	'369	'05	'044	'07	+ '005	'09	111
22	202	'197	'04	'081	'07	'377	'05	'046	'07	'014	'09	112
23	203	'194	'04	'084	'07	'384	'05	'048	'07	'023	'09	113
24	204	'189	'04	'088	'07	'391	'04	'051	'07	'033	'08	114
25	205	'186	'05	'091	'06	'398	'04	'053	'06	'042	'08	115
26	206	'181	'05	'094	'06	'404	'04	'055	'06	'051	'08	116
27	207	'177	'05	'097	'06	'410	'04	'057	'06	'059	'08	117
28	208	'172	'05	'100	'06	'416	'03	'059	'06	'068	'08	118
29	209	'167	'05	'103	'05	'420	'03	'061	'06	'076	'08	119
30	210	'161	'06	'106	'05	'424	'03	'063	'05	'085	'08	120
31	211	'156	'06	'108	'05	'428	'02	'064	'05	'093	'08	121
32	212	'151	'06	'110	'05	'431	'02	'065	'05	'101	'08	122
33	213	'145	'06	'113	'04	'433	'02	'067	'04	'110	'07	123
34	214	'139	'06	'115	'04	'436	'01	'068	'04	'118	'07	124
35	215	'133	'07	'117	'04	'437	'01	'069	'04	'126	'07	125
36	216	'127	'07	'119	'04	'438	'01	'071	'04	'133	'07	126
37	217	'120	'07	'120	'03	'438	'01	'072	'03	'141	'07	127
38	218	'114	'07	'121	'03	'439	'00	'073	'03	'148	'07	128
39	219	'108	'07	'123	'03	'439	'00	'074	'03	'156	'06	129
40	220	'101	'07	'124	'02	'438	— '00	'075	'02	'163	'06	130
41	221	'093	'07	'125	'02	'436	+ '01	'076	'02	'170	'06	131
42	222	'087	'08	'126	'02	'434	'01	'077	'02	'176	'06	132
43	223	'080	'08	'127	'01	'431	'01	'077	'02	'183	'05	133
44	224	'072	'08	'128	'01	'428	'02	'078	'01	'189	'05	134
45	225	— '065	— '08	— '128	+ '01	— '424	+ '02	+ '078	— '01	+ '195	— '05	135

NOTE.—When the *Argument* is on the right-hand side of the Table, the sign of the correction must be changed.

At Greenwich Transit.								
Date.	Name.	Magnitude.	Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. of C's Dec. in 1 hour of Long.	
1850.			h m s	s	s	° ' "	"	
Jan. 1	$\alpha$ Leonis - *	4	9 33 8.91			N. 10 35		
	$\alpha$ Leonis - *	1½	10 0 22.91			12 42		
	Moon II. L. - -	-	9 44 40.98	151.26	70.23	13 35 35.9	-333.2	
	Moon II. U. -	18.5	10 14 26.89	146.42	69.08	11 39 33.0	604.9	
	$\rho$ Leonis - *	4	10 24 54.66			10 5		
	$\chi$ Leonis - *	4½	10 57 16.57			N. 8 9		
2	$\rho$ Leonis - *	4	10 24 54.69			N. 10 5		
	$\chi$ Leonis - *	4½	10 57 16.60			8 9		
	Moon II. L. - -	-	10 43 15.87	141.80	67.98	9 34 34.7	-642.6	
	Moon II. U. -	19.5	11 11 11.67	137.58	66.95	7 23 22.2	667.4	
	$\nu$ Virginis - *	4½	11 38 8.70			7 22		
	$\beta$ Virginis -	3½	11 42 52.66			N. 2 37		
3	$\nu$ Virginis - *	4½	11 38 8.73			N. 7 22		
	$\beta$ Virginis -	3½	11 42 52.69			2 37		
	Moon II. L. - -	-	11 38 19.75	133.86	66.03	5 8 22.0	-680	
	Moon II. U. -	20.6	12 4 46.46	130.69	65.22	N. 2 51 42.8	684	
	$\gamma$ Virginis -	4	12 34 3.26			S. 0 38		
	$\delta$ Virginis - *	3	12 48 2.29			N. 4 13		
4	$\gamma$ Virginis -	4	12 34 3.29			S. 0 38		
	$\delta$ Virginis - *	3	12 48 2.32			N. 4 13		
	Moon II. L. - -	-	12 30 38.61	128.10	64.56	N. 0 35 17.7	-678	
	Moon II. U. -	21.6	12 56 3.19	126.09	64.03	S. 1 39 14.1	665	
	$\alpha$ Virginis -	1	13 17 17.14			S. 10 23		
	$\zeta$ Virginis -	4	13 27 2.48			N. 0 10		
5	$\alpha$ Virginis -	1	13 17 17.17			S. 10 23		
	$\zeta$ Virginis -	4	13 27 2.51			N. 0 10		
	Moon II. L. - -	-	13 21 6.98	124.63	63.64	S. 3 50 26.5	-645	
	Moon II. U. -	22.6	13 45 56.41	123.69	63.38	5 57 3.1	619	
	$\kappa$ Virginis -	4	14 4 53.14			9 34		
	$\lambda$ Virginis -	4	14 10 59.10			S. 12 41		
6	$\kappa$ Virginis -	4	14 4 53.17			S. 9 34		
	$\lambda$ Virginis -	4	14 10 59.13			12 41		
	Moon II. L. - -	-	14 10 37.40	123.22	63.24	7 57 54.4	-588	
	Moon II. U. -	23.7	14 35 15.32	123.17	63.20	9 51 56.9	551	
	$\beta$ Libræ - -	2	15 8 55.20			8 49		
	$\zeta^1$ Libræ - -	4	15 19 47.00			S. 16 11		
7	$\beta$ Libræ - -	2	15 8 55.22			S. 8 49		
	$\zeta^1$ Libræ - -	4	15 19 47.03			16 11		
	Moon II. L. - -	-	14 59 54.78	123.47	63.25	11 38 11.5	-510	
	Moon II. U. -	24.7	15 24 39.63	124.05	63.37	13 15 42.6	464	
	$\eta$ Libræ - -	4½	15 35 37.37			15 11		
	$\theta$ Libræ - -	4½	15 45 16.23			S. 16 17		
8	$\eta$ Libræ - -	4½	15 35 37.40			S. 15 11		



# MOON-CULMINATING STARS. 505

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.	
1850. Jan. 8			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
	♄ Libræ - -	4½	15 45 16.26			S. 16 17		
	Moon II. L. - -	- -	15 49 32.88	124.85	63.54	14 43 36.1	-414.0	
	Moon II. U. 25.8		16 14 36.54	125.78	63.75	16 1 1.6	359.6	
	♅ Ophiuchi -	4½	16 22 32.11			16 17		
	20 Ophiuchi -	5	16 41 30.79			S. 10 31		
9	Moon II. L. - -	- -	16 39 51.68	126.75	63.96	S. 17 7 11.5	-301.4	
	Moon II. U. 26.8		17 5 18.28	127.67	64.17	18 1 22.6	239.9	
10	Moon II. L. - -	- -	17 30 55.36	128.48	64.34	S. 18 42 57.1	-175.4	
	Moon II. U. 27.8		17 56 41.10	129.10	64.47	19 11 24.1	108.7	
11	Moon II. L. - -	- -	18 22 32.91	129.48	64.54	S. 19 26 20.7	-40.5	
	Moon II. U. 28.9		18 48 27.63	129.59	64.55	19 27 34.3	+28.3	
12	Moon II. L. - -	- -	19 14 21.83	129.40	64.49	S. 19 15 2.2	+96.9	
13	Moon II. U. 0.0		19 40 12.08	128.93	64.36	S. 18 48 52.8	+164.4	
	Moon I. L. - -	- -	20 3 46.89	128.26	64.17	18 9 25.8	229.7	
14	Moon I. U. 1.0		20 29 20.77	127.36	63.95	S. 17 17 10.2	+292.3	
	Moon I. L. - -	- -	20 54 43.15	126.35	63.70	16 12 44.4	351.4	
15	Moon I. U. 2.1		21 19 52.97	125.29	63.44	S. 14 56 54.2	+406.3	
	Moon I. L. - -	- -	21 44 50.16	124.26	63.20	13 30 31.9	456.6	
16	Moon I. U. 3.1		22 9 35.72	123.36	62.99	S. 11 54 34.8	+502.1	
	Moon I. L. - -	- -	22 34 11.50	122.65	62.84	10 10 2.5	542.4	
17	♈ Aquarii -	5	22 22 40.65			S. 11 27		
	♈ Aquarii -	4	22 44 45.65			8 23		
	Moon I. U. 4.1		22 58 40.40	122.22	62.76	8 17 58.5	+577.4	
	Moon I. L. - -	- -	23 23 6.13	122.13	62.77	6 19 28.2	606.8	
	♄ Aquarii -	5	23 6 31.83			6 51		
	♄ Aquarii -	5	23 11 7.87			S. 10 26		
18	♄ Aquarii -	5	23 6 31.82			S. 6 51		
	♄ Aquarii -	5	23 11 7.87			10 26		
	Moon I. U. 5.2		23 47 33.09	122.44	62.90	4 15 39.6	+630.4	
	Moon I. L. - -	- -	0 12 6.46	123.21	63.13	2 7 43.0	648.0	
	30 Piscium -	4½	23 54 14.88			6 51		
	33 Piscium -	5	23 57 38.26			S. 6 33		
19	30 Piscium -	4½	23 54 14.87			S. 6 51		
	33 Piscium -	5	23 57 38.26			S. 6 33		
	Moon I. U. 6.2		0 36 52.02	124.47	63.50	N. 0 3 6.8	+659.2	
	Moon I. L. - -	- -	1 1 55.92	126.27	64.00	2 15 30.2	+663.5	
	♅ Piscium *	4	0 55 9.14			7 5		
	♅ Piscium *	5	1 0 38.19			N. 4 51		

At Greenwich Transit.									
Date.	Name.	Mag- nitude.	Apparent Right Ascension in Time.		Var. of ☿'s R.A. in 1 hour of Long.	Sidereal Time of ☿'s Sem. pas. mer.	Declination.		Var. ☿'s D in 1 h of Lon
1850.			h	m	s	"	"	°	'
Jan. 20	ε Piscium *	4	0	55	9.12			N. 7	5
	e Piscium *	5	1	0	38.18			4	51
	Moon I. U.	7.2	1	27	24.70	128.62	64.63	4	28 0.9
	Moon I. L.	-	1	53	24.96	131.52	65.40	6	39 3.2
	o Piscium *	5	1	37	28.25			8	24
	ξ <sup>1</sup> Ceti - *	5	2	5	3.11			N. 8	8
21	o Piscium *	5	1	37	28.24			N. 8	24
	ξ <sup>1</sup> Ceti - *	5	2	5	3.10			8	8
	Moon I. U.	8.3	2	20	3.37	134.97	66.30	8	46 52.1
	Moon I. L.	-	2	47	26.21	138.91	67.29	10	49 30.0
	ν Ceti - *	4½	2	28	0.21			4	56
	B.A.C. 845*	4	2	36	50.23			N. 9	29
22	ν Ceti - *	4½	2	28	0.19			N. 4	56
	B.A.C. 845*	4	2	36	50.22			9	29
	Moon I. U.	9.3	3	15	38.80	143.25	68.36	12	44 46.8
	Moon I. L.	-	3	44	45.18	147.85	69.48	14	30 20.9
	λ Tauri - *	4	3	52	22.80			12	4
	A <sup>1</sup> Tauri - -	5	3	55	50.38			N.21	40
23	λ Tauri - *	4	3	52	22.77			N.12	4
	A <sup>1</sup> Tauri - -	5	3	55	50.36			21	40
	Moon I. U.	10.3	4	14	47.47	152.53	70.59	16	3 40.9
	Moon I. L.	-	4	45	45.08	157.02	71.63	17	22 11.5
	α Tauri - -	1	4	27	19.54			16	12
	ε Tauri - -	4½	4	54	8.60			N.21	22
24	α Tauri - -	1	4	27	19.52			N.16	12
	ε Tauri - -	4½	4	54	8.59			21	22
	Moon I. U.	11.4	5	17	34.14	161.05	72.55	18	23 21.4
	Moon I. L.	-	5	50	7.30	164.32	73.27	19	4 54.0
	ζ Tauri - -	3½	5	28	41.68			21	3
	μ Geminor.	3	6	13	53.92			N.22	35
25	ζ Tauri - -	3½	5	28	41.67			N.21	3
	μ Geminor.	3	6	13	53.91			22	35
	Moon I. U.	12.4	6	23	13.73	166.55	73.75	19	24 59.6
	Moon I. L.	-	6	56	39.68	167.55	73.94	19	22 28.1
	ζ Geminor.	4	6	55	13.48			20	47
	δ Geminor.	3½	7	11	10.55			N.22	15
26	ζ Geminor.	4	6	55	13.48			N.20	47
	δ Geminor.	3½	7	11	10.56			22	15
	Moon I. U.	13.5	7	30	9.70	167.23	73.83	18	56 58.6
	Moon I. L.	-	8	3	28.18	165.64	73.44	18	9 2.4
	β Geminor.	1½	7	36	8.74			28	23
	φ Geminor.	5	7	44	19.57			N.27	9
27	β Geminor.	1½	7	36	8.74			N.28	23



# MOON-CULMINATING STARS. 507

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.	
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	"	"	<sup>°</sup> <sup>'</sup> <sup>"</sup>	"	
Jan. 27	♊ Geminor.	5	7 44 19.58			N. 27 9		
	Moon I. v.	14.5	8 36 20.80	162.96	72.80	17 0 3.3	-394.2	
	ξ Leonis- *	5	9 23 52.24			11 58		
	ο Leonis- *	4	9 33 9.44			N. 10 34		
28	ξ Leonis- *	5	9 23 52.25			N. 11 58		
	ο Leonis- *	4	9 33 9.45			10 34		
	Moon II. L.	-	9 10 59.80	159.28	71.98	15 32 8.5	-482.6	
	Moon II. v.	15.5	9 42 27.01	155.19	71.03	13 47 57.3	556.7	
	π Leonis- *	4½	9 52 17.85			8 46		
	α Leonis- *	1½	10 0 23.51			N. 12 42		
29	π Leonis- *	4½	9 52 17.87			N. 8 46		
	α Leonis- *	1½	10 0 23.52			12 42		
	Moon II. L.	-	10 13 3.36	150.85	70.01	11 50 27.1	-615.6	
	Moon II. v.	16.6	10 42 47.39	146.51	68.98	9 42 42.5	659.2	
	σ Leonis- *	4	11 13 24.58			6 51		
	τ Leonis- -	4	11 20 13.94			N. 3 41		
30	σ Leonis- *	4	11 13 24.60			N. 6 51		
	τ Leonis- -	4	11 20 13.96			3 41		
	Moon II. L.	-	11 11 40.45	142.38	68.00	7 27 43.2	-688.3	
	Moon II. v.	17.6	11 39 45.89	138.60	67.09	5 8 16.8	703.9	
	π Virginis *	5	11 53 11.80			7 27		
	η Virginis -	3½	12 12 14.31			N. 0 10		
31	π Virginis *	5	11 53 11.83			N. 7 27		
	η Virginis -	3½	12 12 14.33			0 10		
	Moon II. L.	-	12 7 8.49	135.25	66.27	2 46 56.6	-707.6	
	Moon II. v.	18.7	12 33 53.94	132.41	65.57	0 25 57.2	700.7	
	δ Virginis *	3	12 48 3.14			N. 4 13		
	θ Virginis -	4½	13 2 11.50			S. 4 44		
Feb. 1	δ Virginis *	3	12 48 3.16			N. 4 13		
	θ Virginis -	4½	13 2 11.53			S. 4 44		
	Moon II. L.	-	13 0 8.32	130.08	65.00	1 52 44.2	-684.8	
	Moon II. v.	19.7	13 25 57.86	128.26	64.55	4 7 26.3	661.0	
	κ Virginis -	4	14 4 54.00			9 34		
	λ Virginis -	4	14 10 59.97			S. 12 41		
2	κ Virginis -	4	14 4 54.03			S. 9 34		
	λ Virginis -	4	14 11 0.00			12 41		
	Moon II. L.	-	13 51 28.51	126.93	64.21	6 16 41.7	-630.5	
	Moon II. v.	20.7	14 16 45.97	126.05	63.99	8 19 15.8	594.2	
	α <sup>2</sup> Libræ -	2½	14 42 35.10			15 25		
	ξ <sup>2</sup> Libræ -	5	14 48 37.97			S. 10 48		
3	α <sup>2</sup> Libræ -	2½	14 42 35.13			S. 15 25		
	ξ <sup>2</sup> Libræ -	5	14 48 38.00			10 48		
	Moon II. L.	-	14 41 55.39	125.58	63.87	S. 10 14 2.9	-552.8	

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☿'s R. A. in 1 hour of Long.	Sidereal Time of ☿'s Sem. pas. mer.	Declination.	Var. ☿'s L. in 1 h of L.	
1850.			h m s	s	s	° ' "		
Feb. 3	Moon II. U.	21 '8	15 7 1 '37	125 '47	63 '84	S. 12 0 4 '6	-50	
	γ Libræ - -	4½	15 27 8 '04			14 17		
	η Libræ - -	4½	15 35 38 '21			S. 15 11		
4	γ Libræ - -	4½	15 27 8 '07			S. 14 17		
	η Libræ - -	4½	15 35 38 '24			15 11		
	Moon II. L.	- -	15 32 7 '73	125 '64	63 '88	13 36 29 '1	-45	
	Moon II. U.	22 '8	15 57 17 '62	126 '04	63 '97	15 2 29 '6	40	
	σ Scorpii - -	4	16 12 4 '00			25 14		
	α Scorpii - -	1½	16 20 12 '29			S. 26 5		
5	σ Scorpii - -	4	16 12 4 '03			S. 25 14		
	α Scorpii - -	1½	16 20 12 '33			26 5		
	Moon II. L.	- -	16 22 33 '37	126 '60	64 '10	16 17 23 '1	-34	
	Moon II. U.	23 '8	16 47 56 '38	127 '24	64 '23	17 20 30 '8	28	
	η Ophiuchi -	2½	17 1 45 '76			15 32		
	θ Ophiuchi -	3½	17 12 46 '98			S. 24 51		
6	η Ophiuchi -	2½	17 1 45 '79			S. 15 32		
	θ Ophiuchi -	3½	17 12 47 '01			24 51		
	Moon II. L.	- -	17 13 27 '22	127 '89	64 '37	18 11 17 '7	-22	
	Moon II. U.	24 '9	17 39 5 '58	128 '49	64 '49	18 49 14 '0	15	
	μ <sup>1</sup> Sagittarii -	4	18 4 46 '25			21 5		
	λ Sagittarii -	4	18 18 41 '38			S. 25 30		
7	μ <sup>1</sup> Sagittarii -	4	18 4 46 '28			S. 21 5		
	λ Sagittarii -	4	18 18 41 '40			25 30		
	Moon II. L.	- -	18 4 50 '40	128 '96	64 '58	19 13 55 '9	-8	
	Moon II. U.	25 '9	18 30 39 '90	129 '26	64 '61	S. 19 25 5 '3	-2	
8	Moon II. L.	- -	18 56 31 '84	129 '36	64 '60	S. 19 22 33 '2	+4	
	Moon II. U.	26 '9	19 22 23 '59	129 '23	64 '53	19 6 18 '2	11	
9	Moon II. L.	- -	19 48 12 '54	128 '89	64 '40	S. 18 36 28 '9	+18	
	Moon II. U.	28 '0	20 13 56 '14	128 '34	64 '23	17 53 23 '2	24	
10	Moon II. L.	- -	20 39 32 '15	127 '64	64 '02	S. 16 57 28 '8	+31	
	Moon II. U.	29 '0	21 4 58 '95	126 '82	63 '79	15 49 22 '9	36	
11	Moon II. L.	- -	21 30 15 '54	125 '95	63 '54	S. 14 29 49 '9	+42	
12	Moon I. U.	0 '2	21 53 15 '14	125 '14	63 '32	S. 12 59 44 '1	+47	
	Moon I. L.	- -	22 18 12 '05	124 '37	63 '12	11 20 4 '3	52	
13	Moon I. U.	1 '3	22 43 0 '59	123 '75	62 '97	S. 9 31 56 '5	+55	
	Moon I. L.	- -	23 7 43 '02	123 '36	62 '89	7 36 29 '9	59	
14	Moon I. U.	2 '3	23 32 22 '37	123 '25	62 '89	S. 5 34 59 '2	+62	
	Moon I. L.	- -	23 57 2 '31	123 '47	62 '98	S. 3 28 42 '0	+64	



# MOON-CULMINATING STARS. 509

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of ☾'s Dec. in 1 hour of Long.
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem- pas. mer	Declination.		
1850. Feb. 15	Moon I. U.	3.3	<sup>h</sup> 0 <sup>m</sup> 21 <sup>s</sup> 47.16	124.07	63.18	S. 1 18 59.0	+654.8	
	Moon I. L.	-	0 46 41.75	125.10	63.49	N. 0 52 44.8	661.2	
16	ε Piscium *	4	0 55 8.81			N. 7 5		
	e Piscium *	5	1 0 37.86			4 51		
	Moon I. U.	4.4	1 11 51.30	126.57	63.91	3 5 0.5	+660.1	
	Moon I. L.	-	1 37 21.28	128.51	64.16	5 16 15.5	651.0	
	ν Piscium *	5	1 33 36.85			4 44		
	o Piscium *	5	1 37 27.88			N. 8 24		
17	ν Piscium *	5	1 33 36.84			N. 4 44		
	o Piscium *	5	1 37 27.87			8 24		
	Moon I. U.	5.4	2 3 17.31	130.91	65.13	7 24 50.4	+633.4	
	Moon I. L.	-	2 29 44.92	133.76	65.89	9 29 0.5	606.8	
	ν Ceti - *	4½	2 27 59.81			4 56		
	B.A.C. 845*	4	2 36 49.82			N. 9 29		
18	ν Ceti - *	4½	2 27 59.79			N. 4 56		
	B.A.C. 845*	4	2 36 49.81			9 29		
	Moon I. U.	6.4	2 56 49.18	137.01	66.75	11 26 54.4	+570.5	
	Moon I. L.	-	3 24 34.56	140.60	67.68	13 16 33.1	524.2	
	ξ Tauri - *	4	3 19 2.49			9 12		
	e Tauri - *	5	3 40 2.80			N.10 41		
19	ξ Tauri - *	4	3 19 2.47			N. 9 12		
	e Tauri - *	5	3 40 2.79			10 41		
	Moon I. U.	7.5	3 53 4.38	144.40	68.64	14 55 52.5	+467.3	
	Moon I. L.	-	4 22 20.40	148.27	69.60	16 22 44.4	399.6	
	ε Tauri -	3½	4 19 51.59			18 51		
	α Tauri -	1	4 27 19.14			N.16 12		
20	ε Tauri -	3½	4 19 51.57			N.18 51		
	α Tauri -	1	4 27 19.12			16 12		
	Moon I. U.	8.5	4 52 22.37	152.02	70.51	17 35 0.1	+321.3	
	Moon I. L.	-	5 23 7.64	155.45	71.33	18 30 36.2	233.2	
	β Tauri -	2	5 16 49.10			28 28		
	ζ Tauri -	3½	5 28 41.34			N.21 3		
21	β Tauri -	2	5 16 49.08			N.28 28		
	ζ Tauri -	3½	5 28 41.33			21 3		
	Moon I. U.	9.5	5 54 30.96	158.32	72.00	19 7 42.2	+136.5	
	Moon I. L.	-	6 26 24.44	160.45	72.47	19 24 47.8	+ 33.5	
	μ Geminor.	3	6 13 53.65			22 35		
	γ Geminor.	2½	6 29 3.28			N.16 31		
22	μ Geminor.	3	6 13 53.64			N.22 35		
	γ Geminor.	2½	6 29 3.27			16 31		
	Moon I. U.	10.6	6 58 38.04	161.65	72.72	19 20 51.5	- 73.2	
	Moon I. L.	-	7 31 0.19	161.87	72.74	18 55 28.4	-180.4	
	δ Geminor.	3½	7 11 10.40			N.22 15		

# 510 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. C's D in 1 h of Lon	
1850.			h m s	s	s	° ' "		
Feb. 22	κ Geminor.	4	7 35 23 '96			N.24 45		
23	δ Geminor.	3½	7 11 10 '39			N.22 15		
	κ Geminor.	4	7 35 23 '95			24 45		
	Moon I. U.	11 '6	8 3 18 '96	161 '09	72 '51	18 8 54 '1	—284	
	Moon I. L.	- -	8 35 22 '81	159 '41	72 '08	17 2 6 '1	382	
	δ Cancrī - -	4½	8 36 10 '16			18 42		
	α Cancrī - *	4	8 50 17 '70			N.12 26		
24	δ Cancrī - -	4½	8 36 10 '15			N.18 42		
	α Cancrī - *	4	8 50 17 '70			12 26		
	Moon I. U.	12 '7	9 7 1 '90	157 '00	71 '48	15 36 40 '4	—470	
	Moon I. L.	- -	9 38 8 '55	154 '04	70 '75	13 54 44 '6	546	
	ο Leonis - *	4	9 33 9 '64			10 34		
	α Leonis - *	1½	10 0 23 '76			N.12 42		
25	ο Leonis - *	4	9 33 9 '64			N.10 34		
	α Leonis - *	1½	10 0 23 '77			12 42		
	Moon I. U.	13 '7	10 8 37 '62	150 '77	69 '94	11 58 51 '0	—609	
	ρ Leonis - *	4	10 24 55 '64			10 5		
	χ Leonis - *	4½	10 57 17 '69			N. 8 9		
26	ρ Leonis - *	4	10 24 55 '65			N.10 5		
	χ Leonis - *	4½	10 57 17 '70			8 9		
	Moon II. L.	- -	10 40 44 '75	147 '24	69 '11	9 51 45 '2	—658	
	Moon II. U.	14 '7	11 9 51 '54	143 '92	68 '29	7 36 19 '2	693	
	τ Leonis - -	4	11 20 14 '37			3 41		
	β Virginis -	3½	11 42 53 '93			N. 2 37		
27	τ Leonis - -	4	11 20 14 '40			N. 3 41		
	β Virginis -	3½	11 42 53 '95			2 37		
	Moon II. L.	- -	11 38 19 '54	140 '79	67 '52	5 15 22 '0	—714	
	Moon II. U.	15 '8	12 6 11 '77	137 '97	66 '83	N. 2 51 34 '6	721	
	γ Virginis -	4	12 34 4 '68			S. 0 38		
	δ Virginis *	3	12 48 3 '76			N. 4 13		
28	γ Virginis -	4	12 34 4 '70			S. 0 38		
	δ Virginis *	3	12 48 3 '77			N. 4 13		
	Moon II. L.	- -	12 33 32 '20	135 '50	66 '22	N. 0 27 26 '4	—717	
	Moon II. U.	16 '8	13 0 25 '36	133 '43	65 '72	S. 1 54 48 '0	703	
	α Virginis -	1	13 17 18 '68			S.10 23		
	ζ Virginis -	4	13 27 4 '03			N. 0 10		
Mar. 1	α Virginis -	1	13 17 18 '70			S.10 23		
	ζ Virginis -	4	13 27 4 '05			N. 0 10		
	Moon II. L.	- -	13 26 55 '98	131 '75	65 '31	S. 4 13 9 '3	—679	
	Moon II. U.	17 '8	13 53 8 '81	130 '45	65 '01	6 25 53 '1	—647	
	κ Virginis -	4	14 4 54 '76			9 34		
	λ Virginis -	4	14 11 0 '74			S.12 41		



# MOON-CULMINATING STARS. 511

Date.	Name.	Mag- nitude.	At Greenwich Transit.				
			Apparent Right Ascension in Time.	Var. of ☉'s R.A. in 1 hour of Long.	Sidereal Time of ☉'s Sem. pas. mer.	Declination.	Var. of ☉'s Dec. in 1 hour of Long.
1850.			h m s	s	s	° ' "	"
Mar. 2	κ Virginis -	4	14 4 54.79			S. 9 34	
	λ Virginis -	4	14 11 0.77			12 41	
	Moon II. L. -	-	14 19 8.32	129.52	64.79	8 31 29.1	-608.0
	Moon II. v. -	18.9	14 44 58.63	128.91	64.66	10 28 39.9	562.9
	β Libræ -	2	15 8 56.85			8 50	
	37 Libræ -	4	15 25 59.46			S. 9 33	
3	β Libræ -	2	15 8 56.88			S. 8 50	
	37 Libræ -	4	15 25 59.48			9 33	
	Moon II. L. -	-	15 10 43.35	128.58	64.60	12 16 19.1	-512.8
	Moon II. v. -	19.9	15 36 25.53	128.48	64.59	13 53 29.9	458.4
	δ Scorp̄i -	3	15 51 28.60			22 11	
	β¹ Scorp̄i -	2	15 56 43.54			S. 19 23	
4	δ Scorp̄i -	3	15 51 28.63			S. 22 11	
	β¹ Scorp̄i -	2	15 56 43.57			19 23	
	Moon II. L. -	-	16 2 7.54	128.55	64.62	15 19 24.8	-400.2
	Moon II. v. -	20.9	16 27 51.09	128.73	64.68	16 33 22.5	338.9
	η Ophiuchi -	2½	17 1 46.58			15 32	
	ν Serpentis -	4½	17 12 23.42			S. 12 41	
5	η Ophiuchi -	2½	17 1 46.61			S. 15 32	
	ν Serpentis -	4½	17 12 23.45			12 41	
	Moon II. L. -	-	16 53 37.19	128.96	64.74	17 34 49.0	-275.1
	Moon II. v. -	22.0	17 19 26.19	129.20	64.80	18 23 16.6	209.2
	4 Sagittarii -	5	17 50 37.60			23 48	
	μ¹ Sagittarii -	4	18 4 47.03			S. 21 5	
6	4 Sagittarii -	5	17 50 37.63			S. 23 48	
	μ¹ Sagittarii -	4	18 4 47.06			21 5	
	Moon II. L. -	-	17 45 17.77	129.38	64.84	18 58 23.7	-141.8
	Moon II. v. -	23.0	18 11 11.06	129.48	64.84	19 19 55.1	73.3
	ξ² Sagittarii -	4	18 48 45.84			21 18	
	σ Sagittarii -	4½	18 55 40.51			S. 21 57	
7	ξ² Sagittarii -	4	18 48 45.87			S. 21 18	
	σ Sagittarii -	4½	18 55 40.53			21 57	
	Moon II. L. -	-	18 37 4.82	129.46	64.81	19 27 41.5	-4.4
	Moon II. v. -	24.0	19 2 57.48	129.29	64.74	19 21 40.2	+64.5
	h² Sagittarii -	4½	19 27 33.40			25 13	
	e² Sagittarii -	5	19 33 55.15			S. 16 28	
8	h² Sagittarii -	4½	19 27 33.43			S. 25 13	
	e² Sagittarii -	5	19 33 55.17			16 28	
	Moon II. L. -	-	19 28 47.31	128.99	64.63	19 1 57.2	+132.6
	Moon II. v. -	25.1	19 54 32.73	128.55	64.48	18 28 43.9	+199.4
	α² Capricorni -	3½	20 9 42.57			13 0	
	ρ Capricorni -	5	20 20 16.71			S. 18 18	
9	α² Capricorni -	3½	20 9 42.59			S. 13 0	

# 512 MOON-CULMINATING STARS.

At Greenwich Transit.								
Date.	Name.	Mag- nitude.	Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. C's D in 1 hr of Lon	
1850.			h m s	s	s	° ' "	"	
Mar. 9	$\rho$ Capricorni	5	20 20 16.74			S. 18 18		
	Moon II. L.	-	20 20 12.18	128.01	64.30	17 42 20.0	+264	
	Moon II. U.	26.1	20 45 44.60	127.39	64.10	S. 16 43 13.0	326	
10	Moon II. L.	-	21 11 9.37	126.74	63.90	S. 15 31 57.5	+385	
	Moon II. U.	27.1	21 36 26.33	126.10	63.69	14 9 16.1	440	
11	Moon II. L.	-	22 1 36.04	125.54	63.51	S. 12 35 57.9	+491	
	Moon II. U.	28.2	22 26 39.67	125.09	63.36	10 53 0.4	537	
12	Moon II. L.	-	22 51 38.99	124.83	63.27	S. 9 1 26.7	+577	
	Moon II. U.	29.2	23 16 36.41	124.79	63.24	7 2 27.5	611	
13	Moon I. L.	-	23 39 28.36	125.00	63.29	S. 4 57 20.1	+638	
14	Moon I. U.	0.5	0 4 31.10	125.52	63.43	S. 2 47 27.5	+658	
	Moon I. L.	-	0 29 42.16	126.38	63.67	S. 0 34 19.3	671	
15	Moon I. U.	1.5	0 55 5.65	127.60	64.01	N. 1 40 28.3	+675	
	Moon I. L.	-	1 20 46.02	129.20	64.45	3 55 14.3	670	
16	Moon I. U.	2.6	1 46 47.86	131.17	65.00	N. 6 8 11.9	+657	
	Moon I. L.	-	2 13 15.49	133.50	65.63	8 17 28.6	634	
17	Moon I. U.	3.6	2 40 13.03	136.14	66.34	N. 10 21 7.8	+600	
	Moon I. L.	-	3 7 43.93	139.05	67.12	12 17 9.5	557	
	$\delta$ Arietis -	4	3 3 2.75			19 9		
	$\xi$ Tauri - *	4	3 19 2.06			N. 9 12		
18	$\delta$ Arietis -	4	3 3 2.73			N. 19 9		
	$\xi$ Tauri - *	4	3 19 2.05			9 12		
	Moon I. U.	4.7	3 35 50.89	142.13	67.92	14 3 31.1	+504	
	Moon I. L.	-	4 4 35.21	145.26	68.73	15 38 10.1	440	
	$\epsilon$ Tauri -	3½	4 19 51.10			18 51		
	$\alpha$ Tauri -	1	4 27 18.66			N. 16 12		
19	$\epsilon$ Tauri -	3½	4 19 51.08			N. 18 51		
	$\alpha$ Tauri -	1	4 27 18.64			16 12		
	Moon I. U.	5.7	4 33 56.81	148.31	69.52	16 59 7.2	+367	
	Moon I. L.	-	5 3 53.66	151.11	70.23	18 4 30.1	285	
	$\sigma$ Tauri -	5	5 18 37.55			21 48		
	$\zeta$ Tauri -	3½	5 28 40.84			N. 21 3		
20	$\sigma$ Tauri -	5	5 18 37.53			N. 21 48		
	$\zeta$ Tauri -	3½	5 28 40.82			21 3		
	Moon I. U.	6.7	5 34 21.90	153.51	70.83	18 52 38.7	+195	
	Moon I. L.	-	6 5 15.70	155.35	71.28	19 22 9.8	+ 99	
	$\nu$ Orionis -	4½	5 59 0.52			14 47		
	$\mu$ Geminor.	3	6 13 53.17			N. 22 35		



# MOON-CULMINATING STARS. 513

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☉'s R. A. in 1 hour of Long.	Sidereal Time of ☉'s Sem. pas. mer.	Declination.	Var. of ☉'s Dec. in 1 hour of Long.	
1850. Jan. 21	☿ Orionis -	4½	h m s 5 59 0.50	"	"	N. 14 47	"	
	♊ Geminor. -	3	6 13 53.15			22 35		
	Moon I. v.	7.8	6 36 27.51	156.50	71.57	19 32 3.5	— 0.7	
	Moon I. L.	- -	7 7 48.71	156.90	71.66	19 21 47.0	102.1	
	♋ Geminor. -	4	6 55 12.85			20 47		
	♌ Geminor. -	3½	7 11 9.99			N. 22 15		
22	♋ Geminor. -	4	6 55 12.83			N. 20 47		
	♌ Geminor. -	3½	7 11 9.97			22 15		
	Moon I. v.	8.8	7 39 10.06	156.53	71.57	18 51 17.6	— 202.4	
	Moon I. L.	- -	8 10 22.55	155.44	71.29	18 1 5.6	298.8	
	♊ Cancri -	5½	8 23 2.83			18 36		
	♋ Cancri -	4½	8 36 9.89			N. 18 42		
23	♊ Cancri -	5½	8 23 2.81			N. 18 36		
	♋ Cancri -	4½	8 36 9.88			18 42		
	Moon I. v.	9.9	8 41 18.17	153.73	70.86	16 52 11.0	— 389.0	
	Moon I. L.	- -	9 11 50.30	151.56	70.31	15 26 2.3	470.8	
	α Cancri - *	4	8 50 17.44			12 26		
	κ Cancri - *	5	8 59 37.83			N. 11 16		
24	α Cancri - *	4	8 50 17.44			N. 12 26		
	κ Cancri - *	5	8 59 37.83			11 16		
	Moon I. v.	10.9	9 41 54.26	149.07	69.68	13 44 31.1	— 542.5	
	Moon I. L.	- -	10 11 27.25	146.42	69.01	11 49 46.7	602.9	
	π Leonis - *	4½	9 52 17.98			8 46		
	α Leonis - *	1½	10 0 23.68			N. 12 42		
25	π Leonis - *	4½	9 52 17.98			N. 8 46		
	α Leonis - *	1½	10 0 23.67			12 42		
	Moon I. v.	11.9	10 40 28.27	143.77	68.33	9 44 10.8	— 651.0	
	Moon I. L.	- -	11 8 58.10	141.23	67.67	7 30 11.8	686.7	
	σ Leonis - *	4	11 13 25.12			6 51		
	τ Leonis - -	4	11 20 14.51			N. 3 41		
26	σ Leonis - *	4	11 13 25.12			N. 6 51		
	τ Leonis - -	4	11 20 14.51			3 41		
	Moon I. v.	13.0	11 36 58.66	138.90	67.06	5 10 20.0	— 709.9	
	Moon I. L.	- -	12 4 32.85	136.85	66.53	2 47 3.5	720.9	
	π Virginis *	5	11 53 12.53			7 27		
	η Virginis -	3½	12 12 15.12			N. 0 10		
27	π Virginis *	5	11 53 12.54			N. 7 27		
	η Virginis -	3½	12 12 15.13			0 10		
	Moon II. v.	14.0	12 33 56.45	135.04	66.08	N. 0 22 45.0	— 720.3	
	θ Virginis -	4½	13 2 12.53			S. 4 44		
	α Virginis -	1	13 17 19.08			S. 10 23		
28	θ Virginis -	4½	13 2 12.54			S. 4 44		
	α Virginis -	1	13 17 19.10			S. 10 23		

# 514 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of R.A. in 1 hour of Long.	Side real Time of C's Sem. pas. mer.	Declination.	Var. of C's Dn in 1 ho of Lon
			Apparent Right Ascension in Time.								
1850.			h m s								
Mar. 28	Moon II. L.	- -	13 0 48.16	133.64	65.72	S. 2 0 21.0	-708				
	Moon II. U.	15.0	13 27 25.03	132.56	65.45	4 20 9.2	687				
	κ Virginis -	4	14 4 55.28			9 34					
	λ Virginis -	4	14 11 1.28			S. 12 41					
29	κ Virginis -	4	14 4 55.30			S. 9 34					
	λ Virginis -	4	14 11 1.30			12 41					
	Moon II. L.	- -	13 53 50.83	131.78	65.26	6 34 45.2	-657				
	Moon II. U.	16.1	14 20 8.92	131.27	65.15	8 42 27.2	618				
	ξ Libræ -	5	14 48 39.39			10 48					
	δ Libræ -	4½	14 52 59.11			S. 7 55					
30	ξ Libræ -	5	14 48 39.41			S. 10 48					
	δ Libræ -	4½	14 52 59.13			7 55					
	Moon II. L.	- -	14 46 22.31	130.99	65.10	10 41 43.4	-573				
	Moon II. U.	17.1	15 12 33.34	130.88	65.09	12 31 15.4	521				
	β Scorpis -	3	15 51 29.35			22 11					
	β Scorpis -	2	15 56 44.29			S. 19 23					
31	δ Scorpis -	3	15 51 29.38			S. 22 11					
	β Scorpis -	2	15 56 44.32			19 23					
	Moon II. L.	- -	15 38 43.81	130.89	65.12	14 9 55.1	-464				
	Moon II. U.	18.1	16 4 54.86	130.96	65.17	15 36 45.2	403				
	χ Ophiuchi -	5	16 18 21.15			18 7					
	φ Ophiuchi -	4½	16 22 34.53			S. 16 17					
Apr. 1	χ Ophiuchi -	5	16 18 21.18			S. 18 7					
	φ Ophiuchi -	4½	16 22 34.56			16 17					
	Moon II. L.	- -	16 31 6.87	131.04	65.22	16 50 59.7	-338				
	Moon II. U.	19.2	16 57 19.73	131.09	65.26	17 52 2.6	271				
	ν Serpentis -	4½	17 12 24.23			12 41					
	ο Serpentis -	4½	17 32 59.69			S. 12 47					
2	ν Serpentis -	4½	17 12 24.26			S. 12 41					
	ο Serpentis -	4½	17 32 59.72			12 47					
	Moon II. L.	- -	17 23 32.66	131.05	65.27	18 39 26.5	-202				
	Moon II. U.	20.2	17 49 44.44	130.90	65.25	19 12 53.7	132				
	μ Sagittarii -	4	18 4 47.90			21 5					
	λ Sagittarii -	4	18 18 43.06			S. 25 30					
3	μ Sagittarii -	4	18 4 47.93			S. 21 5					
	λ Sagittarii -	4	18 18 43.10			25 30					
	Moon II. L.	- -	18 15 53.69	130.62	65.19	19 32 14.9	-61				
	Moon II. U.	21.2	18 41 58.71	130.19	65.08	19 37 29.3	+ 9				
	ο Sagittarii -	4½	18 55 41.35			21 57					
	π Sagittarii -	4½	19 0 50.33			S. 21 15					
4	ο Sagittarii -	4½	18 55 41.39			S. 21 57					
	π Sagittarii -	4½	19 0 50.36			21 15					
	Moon II. L.	- -	19 7 57.83	129.64	64.94	S. 19 28 42.0	+ 78				



At Greenwich Transit.									
Date.	Name.	Magnitude.	Apparent Right Ascension in Time.			Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.
1850.			<sup>h</sup>	<sup>m</sup>	<sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
Apr. 4	Moon II. U.	22.3	19	33	49.67	128.98	64.77	S. 19 6 6.1	+147.0
	α Capricorni	3½	20	9	43.27			13 0	
	β Capricorni	3½	20	12	34.28			S. 15 15	
5	α Capricorni	3½	20	9	43.30			S. 13 0	
	β Capricorni	3½	20	12	34.31			15 15	
	Moon II. L.	-	19	59	32.90	128.22	64.56	18 30 1.8	+213.4
	Moon II. U.	23.3	20	25	6.90	127.44	64.33	17 40 54.0	277.5
	ν Aquarii -	5	21	1	24.43			11 59	
	29 Capricorni	5	21	7	25.66			S. 15 47	
6	ν Aquarii -	5	21	1	24.46			S. 11 59	
	29 Capricorni	5	21	7	25.69			15 47	
	Moon II. L.	-	20	50	31.46	126.66	64.10	16 39 13.4	+338.8
	Moon II. U.	24.3	21	15	47.02	125.95	63.89	15 25 36.0	396.9
	β Aquarii -	3	21	23	38.87			6 14	
	δ Capricorni	3½	21	38	44.48			S. 16 48	
7	β Aquarii -	3	21	23	38.89			S. 6 14	
	δ Capricorni	3½	21	38	44.51			16 48	
	Moon II. L.	-	21	40	54.60	125.34	63.70	14 0 42.8	+451.4
	Moon II. U.	25.4	22	5	55.83	124.90	63.54	12 25 20.1	501.7
	σ Aquarii -	5	22	22	41.30			11 27	
	λ Aquarii -	4	22	44	46.12			S. 8 23	
8	Moon II. L.	-	22	30	52.98	124.67	63.44	S. 10 40 20.3	+547.5
	Moon II. U.	26.4	22	55	48.89	124.69	63.41	8 46 41.0	588.2
9	Moon II. L.	-	23	20	46.83	125.02	63.46	S. 6 45 26.9	+623.2
	Moon II. U.	27.5	23	45	50.60	125.67	63.60	4 37 50.9	651.7
10	Moon II. L.	-	0	11	4.30	126.67	63.83	S. 2 25 13.9	+673.2
	Moon II. U.	28.5	0	36	32.22	128.05	64.17	S. 0 9 5.6	686.8
11	Moon II. L.	-	1	2	19.05	129.82	64.61	N. 2 8 55.0	+691.8
12	Moon I. U.	0.0	1	26	19.08	131.86	65.15	N. 4 26 58.8	+687.2
	Moon I. L.	-	1	52	55.77	134.32	65.78	6 43 7.2	672.4
13	Moon I. U.	1.0	2	20	3.98	137.09	66.49	N. 8 55 13.2	+646.7
	Moon I. L.	-	2	47	46.96	140.10	67.26	11 1 3.0	609.6
14	Moon I. U.	2.1	3	16	7.01	143.25	68.07	N. 12 58 18.2	+560.9
	Moon I. L.	-	3	45	4.99	146.41	68.88	14 44 39.1	500.7
15	Moon I. U.	3.1	4	14	40.24	149.43	69.64	N. 16 17 50.1	+429.4
	Moon I. L.	-	4	44	50.09	152.14	70.33	17 35 44.3	+348.0
16	α Tauri -	1	4	27	18.25			N. 16 12	
	ε Tauri - *	5	4	31	41.76			N. 11 54	

# 516 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. in 11 of L.
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.		
1850. Apr. 16	Moon I. U.	4.2	<sup>h</sup> 5 <sup>m</sup> 15 <sup>s</sup> 29.74	154.37	70.90	N. 18 36 29.2	+251	
	Moon I. L.	-	5 46 32.55	155.98	71.32	19 18 33.4	161	
	η Geminor.	4	6 5 48.79			22 33		
	μ Geminor.	3	6 13 52.68			N. 22 35		
17	η Geminor.	4	6 5 48.77			N. 22 33		
	μ Geminor.	3	6 13 52.66			22 35		
	Moon I. U.	5.2	6 17 50.21	156.84	71.56	19 40 51.8	+60	
	Moon I. L.	-	6 49 13.44	156.89	71.60	19 42 49.1	-41	
	γ Geminor.	2½	6 29 2.33			16 31		
	ε Geminor.	3	6 34 41.78			N. 25 16		
18	γ Geminor.	2½	6 29 2.31			N. 16 31		
	ε Geminor.	3	6 34 41.77			25 16		
	Moon I. U.	6.2	7 20 32.58	156.16	71.45	19 24 23.0	-142	
	Moon I. L.	-	7 51 38.51	154.71	71.12	18 46 2.2	240	
	β Geminor.	1½	7 36 7.71			28 23		
	φ Geminor.	5	7 44 18.59			N. 27 9		
19	β Geminor.	1½	7 36 7.69			N. 28 23		
	φ Geminor.	5	7 44 18.57			27 9		
	Moon I. U.	7.3	8 22 23.26	152.66	70.64	17 48 44.7	-331	
	Moon I. L.	-	8 52 40.67	150.18	70.05	16 33 53.8	415	
	δ Cancri -	4½	8 36 9.44			18 42		
	α Cancri - *	4	8 50 17.05			N. 12 26		
20	δ Cancri -	4½	8 36 9.43			N. 18 42		
	α Cancri - *	4	8 50 17.04			12 26		
	Moon I. U.	8.3	9 22 26.58	147.44	69.38	15 3 12.5	-489	
	Moon I. L.	-	9 51 38.82	144.60	68.68	13 18 37.0	554	
	ο Leonis - *	4	9 33 9.14			10 34		
	α Leonis - *	1½	10 0 23.38			N. 12 42		
21	ο Leonis - *	4	9 33 9.13			N. 10 34		
	α Leonis - *	1½	10 0 23.37			12 42		
	Moon I. U.	9.3	10 20 17.26	141.82	67.98	11 22 13.7	-607	
	Moon I. L.	-	10 48 23.30	139.22	67.31	9 16 13.9	650	
	δ Leonis - *	5	10 52 49.66			4 25		
	χ Leonis - *	4½	10 57 17.56			N. 8 9		
22	δ Leonis - *	5	10 52 49.65			N. 4 25		
	χ Leonis - *	4½	10 57 17.55			8 9		
	Moon I. U.	10.4	11 15 59.69	136.89	66.70	7 2 49.8	-681	
	Moon I. L.	-	11 43 10.01	134.89	66.16	4 44 13.0	702	
	β Virginis -	3½	11 42 54.04			2 37		
	ο Virginis *	4½	11 57 35.27			N. 9 34		
23	β Virginis -	3½	11 42 54.04			N. 2 37		
	ο Virginis *	4½	11 57 35.27			9 34		
	Moon I. U.	11.4	12 9 58.55	133.26	65.72	N. 2 22 33.6	-712	



## MOON-CULMINATING STARS.

517

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Declination.	Var. of ☾'s Dec. in 1 hour of Long.
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.				
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		
Apr. 23	Moon I. L.	- -	12 36 29.83	132.01	65.38	S. 0 0 2.4	-712.0		
	γ Virginis -	4	12 34 5.03			S. 0 38			
	δ Virginis *	3	12 48 4.18			N. 4 13			
24	γ Virginis -	4	12 34 5.03			S. 0 38			
	δ Virginis *	3	12 48 4.18			N. 4 13			
	Moon I. U.	12.5	13 2 48.35	131.13	65.12	S. 2 21 35.3	-701.8		
	Moon I. L.	- -	13 28 58.45	130.61	64.97	4 40 8.5	682.2		
	α Virginis -	1	13 17 19.26			S. 10 23			
	ζ Virginis -	4	13 27 4.64			N. 0 10			
25	α Virginis -	1	13 17 19.26			S. 10 23			
	ζ Virginis -	4	13 27 4.64			N. 0 10			
	Moon I. U.	13.5	13 55 4.11	130.38	64.90	S. 6 53 53.4	-653.8		
	μ Virginis -	4½	14 35 11.22			5 0			
	α <sup>s</sup> Libræ -	2½	14 42 36.90			S. 15 25			
26	μ Virginis -	4½	14 35 11.24			S. 5 0			
	α <sup>s</sup> Libræ -	2½	14 42 36.92			15 25			
	Moon II. L.	- -	14 23 18.51	130.43	64.90	9 1 7.8	-617.3		
	Moon II. U.	14.5	14 49 24.95	130.67	64.96	11 0 18.0	573.2		
	β Libræ -	2	15 8 57.94			8 50			
	37 Libræ -	4	15 26 0.64			S. 9 33			
27	β Libræ -	2	15 8 57.95			S. 8 50			
	37 Libræ -	4	15 26 0.65			9 33			
	Moon II. L.	- -	15 15 35.09	131.04	65.06	12 49 57.8	-522.3		
	Moon II. U.	15.6	15 41 50.08	131.46	65.18	14 28 50.7	465.6		
	δ Scorpil -	3	15 51 29.95			22 11			
	β <sup>1</sup> Scorpil -	2	15 56 44.88			S. 19 23			
28	δ Scorpil -	3	15 51 29.97			S. 22 11			
	β <sup>1</sup> Scorpil -	2	15 56 44.90			19 23			
	Moon II. L.	- -	16 8 10.13	131.87	65.30	15 55 51.9	-403.8		
	Moon II. U.	16.6	16 34 34.66	132.20	65.41	17 10 5.7	337.9		
	η Ophiuchi -	2½	17 1 48.08			15 32			
	ξ Ophiuchi -	4½	17 12 2.49			S. 20 57			
29	η Ophiuchi -	2½	17 1 48.10			S. 15 32			
	ξ Ophiuchi -	4½	17 12 2.52			20 57			
	Moon II. L.	- -	17 1 2.27	132.38	65.49	18 10 48.3	-268.8		
	Moon II. U.	17.6	17 27 30.98	132.37	65.51	18 57 28.9	197.6		
	4 Sagittarii -	5	17 50 39.27			23 48			
	μ <sup>1</sup> Sagittarii -	4	18 4 48.68			S. 21 5			
30	4 Sagittarii -	5	17 50 39.30			S. 23 48			
	μ <sup>1</sup> Sagittarii -	4	18 4 48.71			21 5			
	Moon II. L.	- -	17 53 58.33	132.15	65.49	19 29 47.0	-125.3		
	Moon II. U.	18.7	18 20 21.65	131.70	65.41	19 47 34.5	52.7		
	o Sagittarii -	4½	18 55 42.19			S. 21 57			

At Greenwich Transit.								
Date.	Name.	Magnitude.	Apparent Right Ascension in Time.	Var. of $\zeta$ 's R.A. in 1 hour of Long.	Sidereal Time of $\zeta$ 's Sem. pas. mer.	Declination.	Var. of $\zeta$ 's in 1 hour of Long.	
1850.			h m s	s	s	° ' "		
Apr. 30	$\pi$ Sagittarii -	4½	19 0 51.17			S. 21 15		
May 1	$\alpha$ Sagittarii -	4½	18 55 42.22			S. 21 57		
	$\pi$ Sagittarii -	4½	19 0 51.20			21 15		
	Moon II. L. -	-	18 46 38.21	131.03	65.27	19 50 52.8	+ 19	
	Moon II. v. -	19.7	19 12 45.54	130.17	65.07	19 39 53.5	90	
	$\lambda^a$ Sagittarii -	4½	19 27 35.11			25 13		
	$\epsilon^a$ Sagittarii -	5	19 33 56.75			S. 16 28		
2	$\lambda^a$ Sagittarii -	4½	19 27 35.14			S. 25 13		
	$\epsilon^a$ Sagittarii -	5	19 33 56.78			16 28		
	Moon II. L. -	-	19 38 41.58	129.15	64.83	19 14 56.8	+ 158	
	Moon II. v. -	20.7	20 4 24.86	128.05	64.56	18 36 29.5	225	
	$\beta$ Capricorni -	3½	20 12 35.12			15 15		
	$\pi$ Capricorni -	5	20 18 44.16			S. 18 42		
3	$\beta$ Capricorni -	3½	20 12 35.16			S. 15 15		
	$\pi$ Capricorni -	5	20 18 44.19			18 42		
	Moon II. L. -	-	20 29 54.62	126.91	64.27	17 45 4.6	+ 288	
	Moon II. v. -	21.8	20 55 10.95	125.82	63.99	16 41 19.4	348	
	$\beta$ Aquarii -	3	21 23 39.60			6 14		
	$\delta$ Capricorni -	3½	21 38 45.23			S. 16 48		
4	$\beta$ Aquarii -	3	21 23 39.63			S. 6 14		
	$\delta$ Capricorni -	3½	21 38 45.26			16 48		
	Moon II. L. -	-	21 20 14.71	124.83	63.73	15 25 54.3	+ 405	
	Moon II. v. -	22.8	21 45 7.55	124.01	63.50	13 59 33.6	457	
	$\epsilon$ Aquarii -	4½	21 58 19.62			14 36		
	$\theta$ Aquarii -	4½	22 8 54.68			S. 8 32		
5	$\epsilon$ Aquarii -	4½	21 58 19.65			S. 14 36		
	$\theta$ Aquarii -	4½	22 8 54.71			8 32		
	Moon II. L. -	-	22 9 51.96	123.43	63.33	12 23 4.6	+ 506	
	Moon II. v. -	23.8	22 34 31.09	123.14	63.21	10 37 16.6	550	
	$\phi$ Aquarii -	5	23 6 32.73			6 51		
	$\psi^a$ Aquarii -	5	23 11 8.75			S. 10 26		
6	$\phi$ Aquarii -	5	23 6 32.76			S. 6 51		
	$\psi^a$ Aquarii -	5	23 11 8.77			10 26		
	Moon II. L. -	-	22 59 8.74	123.19	63.23	8 43 3.5	+ 590	
	Moon II. v. -	24.9	23 23 49.25	123.63	63.31	6 41 24.4	625	
	30 Piscium -	4½	23 54 15.36			6 51		
	33 Piscium -	5	23 57 38.71			S. 6 33		
7	30 Piscium -	4½	23 54 15.38			S. 6 51		
	33 Piscium -	5	23 57 38.73			6 33		
	Moon II. L. -	-	23 48 37.46	124.48	63.50	4 33 23.3	+ 654	
	Moon II. v. -	25.9	0 13 38.60	125.79	63.81	S. 2 20 12.8	676	
8	Moon II. L. -	-	0 38 58.18	127.55	64.25	S. 0 3 14.4	+ 691	



Date.	Name.	Mag- nitude.	At Greenwich Transit.				
			Apparent Right Ascension in Time.	Var. of ☉'s R.A. in 1 hour of Long.	Sidereal Time of ☉'s Sem. pas. mer.	Declination.	Var. of ☉'s Dec. in 1 hour of Long.
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
May 8	Moon II. U.	26.9	1 4 41.78	129.79	64.79	N. 2 15 59.0	+698.9
9	Moon II. L.	- -	1 30 55.02	132.49	65.45	N. 4 35 42.9	+696.7
	Moon II. U.	28.0	1 57 43.21	135.61	66.22	6 53 58.8	684.1
10	Moon II. L.	- -	2 25 11.11	139.10	67.08	N. 9 8 34.6	+659.9
	Moon II. U.	29.0	2 53 22.54	142.85	68.00	11 17 6.5	623.3
11	Moon I. L.	- -	3 20 2.03	146.57	68.95	N.13 17 0.6	+573.5
12	Moon I. U.	0.5	3 49 43.99	150.41	69.88	N.15 5 37.9	+510.5
	Moon I. L.	- -	4 20 10.83	154.00	70.75	16 40 20.5	434.5
13	Moon I. U.	1.6	4 51 18.15	157.12	71.51	N.17 58 39.1	+346.8
	Moon I. L.	- -	5 22 58.87	159.53	72.10	18 58 23.9	249.3
14	Moon I. U.	2.6	5 55 3.30	161.04	72.48	N.19 37 53.2	+144.6
	Moon I. L.	- -	6 27 19.86	161.54	72.62	19 56 0.0	+36.1
15	Moon I. U.	3.6	6 59 36.02	160.98	72.52	N.19 52 18.8	- 72.8
	Moon I. L.	- -	7 31 39.36	159.42	72.19	19 27 6.0	178.6
	♌ Geminor.	3½	7 11 9.11			22 15	
	♋ Geminor.	4	7 35 22.65			N.24 45	
16	♌ Geminor.	3½	7 11 9.10			N.22 15	
	♋ Geminor.	4	7 35 22.65			24 45	
	Moon I. U.	4.7	8 3 18.80	157.03	71.65	18 41 16.9	-278.3
	Moon I. L.	- -	8 34 25.42	153.99	70.95	17 36 19.3	369.7
	♌ Cancri -	4½	8 36 9.04			18 42	
	♋ Cancri - *	4	8 50 16.66			N.12 26	
17	♌ Cancri -	4½	8 36 9.03			N.18 42	
	♋ Cancri - *	4	8 50 16.65			12 26	
	Moon I. U.	5.7	9 4 52.90	150.55	70.14	16 14 5.5	-450.8
	Moon I. L.	- -	9 34 37.84	146.94	69.28	14 36 44.8	520.8
	♌ Leonis - *	4	9 33 8.77			10 34	
	♋ Leonis - *	1½	10 0 23.02			N.12 42	
18	♌ Leonis - *	4	9 33 8.75			N.10 34	
	♋ Leonis - *	1½	10 0 23.01			12 42	
	Moon I. U.	6.8	10 3 39.44	143.35	68.41	12 46 32.9	-579.3
	Moon I. L.	- -	10 31 58.99	139.96	67.57	10 45 48.9	626.2
	♌ Leonis - *	4	10 24 55.03			10 5	
	♋ Leonis - *	5	10 52 49.36			N. 4 25	
19	♌ Leonis - *	4	10 24 55.01			N.10 5	
	♋ Leonis - *	5	10 52 49.34			4 25	
	Moon I. U.	7.8	10 59 39.75	136.90	66.80	8 36 50.0	-661.8
	Moon I. L.	- -	11 26 46.14	134.24	66.12	6 21 48.0	-686.8
	♌ Virginis *	4½	11 38 9.80			N. 7 22	

# 520 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. of C's Dec. in 1 hour of Long.	
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
May 19	β Virginis -	3½	11 42 53.83			N. 2 37		
20	ν Virginis *	4½	11 38 9.79			N. 7 22		
	β Virginis -	3½	11 42 53.82			2 37		
	Moon I. u.	8 8	11 53 23.30	132.04	65.55	4 2 47.1	-701.7	
	Moon I. L.	- -	12 19 36.96	130.32	65.09	1 41 46.5	706.9	
	η Virginis -	3½	12 12 14.94			N. 0 10		
	γ Virginis -	4	12 34 4.90			S. 0 38		
21	η Virginis -	3½	12 12 14.93			N. 0 10		
	γ Virginis -	4	12 34 4.89			S. 0 38		
	Moon I. u.	9.9	12 45 32.95	129.09	64.74	0 39 20.9	-702.9	
	Moon I. L.	- -	13 11 16.87	128.31	64.51	2 58 48.9	690.4	
	θ Virginis -	4½	13 2 12.58			4 44		
	α Virginis -	1	13 17 19.22			S. 10 23		
22	θ Virginis -	4½	13 2 12.58			S. 4 44		
	α Virginis -	1	13 17 19.21			10 23		
	Moon I. u.	10.9	13 36 54.03	127.95	64.40	5 14 56.3	-669.5	
	Moon I. L.	- -	14 2 29.23	127.97	64.37	7 26 5.8	640.8	
	κ Virginis -	4	14 4 55.65			9 34		
	λ Virginis -	4	14 11 1.69			S. 12 41		
23	κ Virginis -	4	14 4 55.65			S. 9 34		
	λ Virginis -	4	14 11 1.69			12 41		
	Moon I. u.	11.9	14 28 6.56	128.30	64.43	9 30 45.9	-604.7	
	Moon I. L.	- -	14 53 49.31	128.86	64.55	11 27 29.8	561.5	
	δ Libræ -	4½	14 52 59.72			7 55		
	β Libræ -	2	15 8 58.18			S. 8 50		
24	δ Libræ -	4½	14 52 59.72			S. 7 55		
	β Libræ -	2	15 8 58.18			8 50		
	Moon I. u.	13.0	15 19 39.86	129.59	64.72	13 14 54.8	-511.7	
	Moon I. L.	- -	15 45 39.62	130.38	64.90	14 51 46.7	456.0	
	δ Scorpil -	3	15 51 30.31			22 11		
	β <sup>1</sup> Scorpil -	2	15 56 45.26			S. 19 23		
25	δ Scorpil -	3	15 51 30.32			S. 22 11		
	β <sup>1</sup> Scorpil -	2	15 56 45.27			19 23		
	Moon II. u.	14.0	16 13 58.99	131.18	65.09	16 16 57.6	-395.0	
	φ Ophiuchi -	4½	16 22 35.60			16 17		
	20 Ophiuchi -	5	16 41 34.25			S. 10 31		
26	φ Ophiuchi -	4½	16 22 35.61			S. 16 17		
	20 Ophiuchi -	5	16 41 34.27			10 31		
	Moon II. L.	- -	16 40 17.22	131.84	65.26	17 29 28.6	-329.5	
	Moon II. u.	15.0	17 6 42.30	132.31	65.39	18 28 31.9	-260.5	
	ξ Serpentis -	5	17 29 1.91			15 18		
	ο Serpentis -	4½	17 33 1.01			S. 12 47		



# MOON-CULMINATING STARS. 521

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☾'s R.A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.	
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	"	"	<sup>°</sup> <sup>'</sup> <sup>"</sup>	"	"
May 27	ξ Serpentis-	5	17 29 1.93			S. 15 18		
	ο Serpentis-	4½	17 33 1.03			12 47		
	Moon II. L.	- -	17 33 11.57	132.53	65.46	19 13 30.0	-188.9	
	Moon II. v.	16.1	17 59 41.75	132.45	65.46	19 43 59.4	115.9	
	φ Sagittarii -	4½	18 36 18.77			27 8		
	σ Sagittarii -	3	18 45 59.49			S. 26 29		
28	φ Sagittarii-	4½	18 36 18.79			S. 27 8		
	σ Sagittarii-	3	18 45 59.52			26 29		
	Moon II. L.	- -	18 26 9.24	132.07	65.39	19 59 48.8	- 42.4	
	Moon II. v.	17.1	18 52 30.29	131.39	65.25	20 0 59.1	+ 30.5	
	π Sagittarii-	4½	19 0 51.96			21 15		
	h² Sagittarii-	4½	19 27 35.93			S. 25 13		
29	π Sagittarii -	4½	19 0 51.99			S. 21 15		
	h² Sagittarii-	4½	19 27 35.96			25 13		
	Moon II. L.	- -	19 18 41.40	130.42	65.03	19 47 42.5	+101.9	
	Moon II. v.	18.1	19 44 39.60	129.24	64.76	19 20 22.9	170.9	
	α² Capricorni	3½	20 9 44.90			13 0		
	β Capricorni	3½	20 12 35.94			S. 15 15		
30	α² Capricorni	3½	20 9 44.93			S. 13 0		
	β Capricorni	3½	20 12 35.97			15 15		
	Moon II. L.	- -	20 10 22.67	127.91	64.45	18 39 32.9	+236.9	
	Moon II. v.	19.2	20 35 49.26	126.51	64.11	17 45 50.1	299.6	
	ι Capricorni	5	21 13 54.17			17 28		
	ζ Capricorni	4	21 18 6.54			S. 23 3		
31	ι Capricorni	5	21 13 54.21			S. 17 28		
	ζ Capricorni	4	21 18 6.57			23 3		
	Moon II. L.	- -	21 0 58.98	125.12	63.77	16 39 58.9	+358.3	
	Moon II. v.	20.2	21 25 52.60	123.83	63.46	15 22 46.7	413.0	
	δ Capricorni	3½	21 38 46.11			16 48		
	ι Aquarii -	4½	21 58 20.46			S. 14 36		
June 1	δ Capricorni	3½	21 38 46.14			S. 16 48		
	ι Aquarii -	4½	21 58 20.49			14 36		
	Moon II. L.	- -	21 50 31.65	122.71	63.18	13 55 3.4	+463.5	
	Moon II. v.	21.2	22 14 58.73	121.85	62.96	12 17 39.8	509.7	
	σ Aquarii -	5	22 22 42.82			11 27		
	λ Aquarii -	4	22 44 47.57			S. 8 23		
2	σ Aquarii -	5	22 22 42.85			S. 11 27		
	λ Aquarii -	4	22 44 47.61			8 23		
	Moon II. L.	- -	22 39 17.30	121.30	62.82	10 31 29.3	+551.4	
	Moon II. v.	22.3	23 3 31.54	121.14	62.77	S. 8 37 25.6	+588.5	
	λ Piscium -	5	23 34 23.81			N. 0 57		
	20 Piscium -	5½	23 40 13.96			S. 3 36		
3	λ Piscium -	5	23 34 23.84			N. 0 57		

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Va C's in 1 of L
			Apparent Right Ascension in Time.	Var. of C's R.A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.		
1850.			h m s	s	s	° ' "		
June 3	20 Piscium -	5½	23 40 13.99			S. 3 36		
	Moon II. L.	- -	23 27 46.28	121.40	62.83	6 36 25.6	+62	
	Moon II. U.	23.3	23 52 7.02	122.14	63.03	4 29 28.9	64	
	12 Ceti - - -	6	0 22 23.10			4 47		
	13 Ceti - - -	6	0 27 31.64			S. 4 25		
4	12 Ceti - - -	6	0 22 23.12			S. 4 47		
	13 Ceti - - -	6	0 27 31.67			4 25		
	Moon II. L.	- -	0 16 39.63	123.39	63.34	2 17 40.5	+66	
	Moon II. U.	24.3	0 41 30.50	125.18	63.79	S. 0 2 13.1	68	
	ε Piscium *	4	0 55 9.74			N. 7 5		
	e Piscium *	5	1 0 38.73			N. 4 51		
5	ε Piscium *	4	0 55 9.77			N. 7 5		
	e Piscium *	5	1 0 38.76			4 51		
	Moon II. L.	- -	1 6 46.20	127.53	64.38	2 15 32.5	+69	
	Moon II. U.	25.4	1 32 33.48	130.44	65.11	4 34 2.2	69	
	ξ <sup>1</sup> Ceti - - *	5	2 5 3.04			8 8		
	ξ <sup>2</sup> Ceti - - *	4	2 20 11.01			N. 7 47		
6	Moon II. L.	- -	1 58 58.91	133.89	65.97	N. 6 51 29.2	+68	
	Moon II. U.	26.4	2 26 8.72	137.83	66.94	9 5 52.7	66	
7	Moon II. L.	- -	2 54 8.30	142.17	68.00	N.11 14 53.5	+62	
	Moon II. U.	27.5	3 23 1.69	146.76	69.12	13 15 58.3	58	
8	Moon II. L.	- -	3 52 50.89	151.43	70.23	N.15 6 22.2	+52	
	Moon II. U.	28.5	4 23 35.38	155.93	71.29	16 43 13.4	44	
9	Moon II. L.	- -	4 55 11.30	159.96	72.23	N.18 3 43.2	+35	
10	Moon I. U.	0.2	5 25 5.32	163.11	73.00	N.19 5 16.7	+25	
	Moon I. L.	- -	5 57 57.47	165.38	73.52	19 45 45.4	14	
11	Moon I. U.	1.2	6 31 9.55	166.41	73.77	N.20 3 40.7	+3	
	Moon I. L.	- -	7 4 26.16	166.13	73.72	19 58 22.4	-8	
12	Moon I. U.	2.3	7 37 31.57	164.57	73.38	N.19 30 2.3	-19	
	Moon I. L.	- -	8 10 11.40	161.90	72.79	18 39 42.9	30	
13	Moon I. U.	3.3	8 42 13.86	158.39	71.98	N.17 29 8.6	-39	
	Moon I. L.	- -	9 13 30.56	154.33	71.05	16 0 36.3	48	
14	ξ Leonis - *	5	9 23 51.21			N.11 58		
	o Leonis - *	4	9 33 8.47			10 34		
	Moon I. U.	4.4	9 43 56.81	150.03	70.03	14 16 42.0	-53	
	Moon I. L.	- -	10 13 31.19	145.73	69.01	12 20 8.4	-60	
	π Leonis - *	4½	9 52 17.02			8 46		
	α Leonis - *	1½	10 0 22.71			N.12 42		



# MOON-CULMINATING STARS. 523

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. of C's Dec. in 1 hour of Long.	
1850.			h m s	s	s	° ' "	"	
June 15	$\pi$ Leonis- *	4½	9 52 17.01			N. 8 46		
	$\alpha$ Leonis- *	1½	10 0 22.70			12 42		
	Moon I. U.	5.4	10 42 15.20	141.66	68.02	10 13 37.9	-653.0	
	Moon I. L.	-	11 10 12.50	137.97	67.11	7 59 45.2	683.7	
	$\sigma$ Leonis- *	4	11 13 24.39			6 51		
	$\tau$ Leonis- -	4	11 20 13.82			N. 3 41		
16	$\sigma$ Leonis- *	4	11 13 24.38			N. 6 51		
	$\tau$ Leonis- -	4	11 20 13.81			3 41		
	Moon I. U.	6.4	11 37 28.25	134.75	66.30	5 40 54.9	-702.9	
	Moon I. L.	-	12 4 8.51	132.06	65.63	3 19 18.5	711.5	
	$\phi$ Virginis *	4½	11 57 34.78			9 34		
	$\eta$ Virginis -	3½	12 12 14.68			N. 0 10		
17	$\phi$ Virginis *	4½	11 57 34.76			N. 9 34		
	$\eta$ Virginis -	3½	12 12 14.67			0 10		
	Moon I. U.	7.5	12 30 19.93	129.94	65.07	N. 0 56 56.8	-710.6	
	Moon I. L.	-	12 56 9.14	128.36	64.66	S. 1 24 21.5	701.1	
	$\theta$ Virginis -	4½	13 2 12.38			4 44		
	$\alpha$ Virginis -	1	13 17 19.04			S. 10 23		
18	$\theta$ Virginis -	4½	13 2 12.37			S. 4 44		
	$\alpha$ Virginis -	1	13 17 19.03			10 23		
	Moon I. U.	8.5	13 21 42.63	127.31	64.37	3 42 56.5	-683.5	
	Moon I. L.	-	13 47 6.52	126.75	64.20	5 57 15.9	658.5	
	$\kappa$ Virginis -	4	14 4 55.55			9 34		
	$\iota$ Virginis -	4	14 8 10.91			S. 5 17		
19	$\kappa$ Virginis -	4	14 4 55.54			S. 9 34		
	$\iota$ Virginis -	4	14 8 10.91			5 17		
	Moon I. U.	9.5	14 12 26.40	126.63	64.15	8 5 53.4	-626.6	
	Moon I. L.	-	14 37 47.10	126.88	64.18	10 7 28.6	588.2	
	$\alpha^2$ Libræ -	2½	14 42 37.05			15 25		
	$\xi^2$ Libræ -	5	14 48 39.96			S. 10 48		
20	$\alpha^2$ Libræ -	2½	14 42 37.05			S. 15 25		
	$\xi^2$ Libræ -	5	14 48 39.96			10 48		
	Moon I. U.	10.6	15 3 12.58	127.42	64.29	12 0 45.5	-543.6	
	Moon I. L.	-	15 28 45.91	128.17	64.45	13 44 32.6	493.2	
	$\gamma$ Libræ -	4½	15 27 10.42			14 17		
	$\eta$ Libræ -	4½	15 35 40.68			S. 15 11		
21	$\gamma$ Libræ -	4½	15 27 10.42			S. 14 17		
	$\eta$ Libræ -	4½	15 35 40.68			15 11		
	Moon I. U.	11.6	15 54 29.05	129.03	64.64	15 17 41.7	-437.4	
	Moon I. L.	-	16 20 22.82	129.93	64.84	16 39 11.5	376.8	
	$\nu$ Scorpïi -	4	16 3 19.13			19 4		
	$\alpha$ Scorpïi -	1½	16 20 15.34			S. 26 6		
22	$\nu$ Scorpïi -	4	16 3 19.13			S. 19 4		

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of ☾'s D. in 1 hr. of Lon.
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer	Declination.		
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
June 22	α Scorpii -	1½	16 20 15.34			S. 26 6		
	Moon I. v.	12.6	16 46 26.98	130.74	65.02	17 48 7.6	-311	
	Moon I. L.	-	17 12 40.03	131.39	65.16	18 43 43.3	243	
	η Ophiuchi -	2½	17 1 48.90			15 32		
	θ Ophiuchi -	3½	17 12 50.40			S. 24 51		
23	η Ophiuchi -	2½	17 1 48.90			S. 15 32		
	θ Ophiuchi -	3½	17 12 50.41			24 51		
	Moon I. v.	13.7	17 38 59.51	131.81	65.25	19 25 21.9	-172	
	Moon I. L.	-	18 5 22.22	131.92	65.26	19 52 37.4	99	
	4 Sagittarii -	5	17 50 40.37			23 48		
	μ <sup>1</sup> Sagittarii -	4	18 4 49.82			S. 21 5		
24	4 Sagittarii -	5	17 50 40.38			S. 23 48		
	μ <sup>1</sup> Sagittarii -	4	18 4 49.83			21 5		
	Moon II. v.	14.7	18 33 54.71	131.69	65.21	20 5 17.5	-26	
	o Sagittarii -	4½	18 55 43.55			21 57		
	π Sagittarii -	4½	19 0 52.54			S. 21 15		
25	o Sagittarii -	4½	18 55 43.56			S. 21 57		
	π Sagittarii -	4½	19 0 52.55			21 15		
	Moon II. L.	-	19 0 11.83	131.11	65.07	20 3 21.4	+45	
	Moon II. v.	15.7	19 26 20.10	130.22	64.85	19 47 0.8	117	
	α <sup>2</sup> Capricorni	3½	20 9 45.58			13 0		
	β Capricorni	3½	20 12 36.63			S. 15 15		
26	α <sup>2</sup> Capricorni	3½	20 9 45.60			S. 13 0		
	β Capricorni	3½	20 12 36.65			15 15		
	Moon II. L.	-	19 52 16.00	129.06	64.58	19 16 39.5	+185	
	Moon II. v.	16.8	20 17 56.62	127.69	64.25	18 32 50.7	251	
	η Capricorni	5	20 55 53.42			20 27		
	ν Aquarii -	5	21 1 26.81			S. 11 59		
27	η Capricorni	5	20 55 53.45			S. 20 27		
	ν Aquarii -	5	21 1 26.83			11 59		
	Moon II. L.	-	20 43 19.98	126.20	63.90	17 36 16.9	+313	
	Moon II. v.	17.8	21 8 25.19	124.67	63.53	16 27 46.3	371	
	δ Capricorni	3½	21 38 46.92			16 48		
	μ Capricorni	5	21 45 8.34			S. 14 15		
28	δ Capricorni	3½	21 38 46.94			S. 16 48		
	μ Capricorni	5	21 45 8.37			14 15		
	Moon II. L.	-	21 33 12.36	123.20	63.17	15 8 11.4	+424	
	Moon II. v.	18.8	21 57 42.64	121.87	62.85	13 38 27.7	472	
	θ Aquarii -	4½	22 8 56.33			8 32		
	σ Aquarii -	5	22 22 43.65			S. 11 27		
29	θ Aquarii -	4½	22 8 56.36			S. 8 32		
	σ Aquarii -	5	22 22 43.67			11 27		
	Moon II. L.	-	22 21 58.23	120.77	62.59	S. 11 59 33.1	+515	



# MOON-CULMINATING STARS. 525

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of ☾'s Dec. in 1 hour of Long.
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.		
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
June 29	Moon II. U.	19.9	22 46 2.28	119.96	62.39	S. 10 12 25.2	+554.6	
	☿ Aquarii -	5	23 6 34.37			6 51		
	♄ Aquarii -	5	23 11 10.40			S. 10 26		
30	☿ Aquarii -	5	23 6 34.40			S. 6 51		
	♄ Aquarii -	5	23 11 10.43			10 26		
	Moon II. L.	-	23 9 58.83	119.52	62.30	8 18 2.6	+588.4	
	Moon II. U.	20.9	23 33 52.54	119.50	62.31	6 17 24.6	617.1	
	30 Piscium -	4½	23 54 16.95			6 51		
	33 Piscium -	5	23 57 40.29			S. 6 33		
July 1	30 Piscium -	4½	23 54 16.98			S. 6 51		
	33 Piscium -	5	23 57 40.32			6 33		
	Moon II. L.	-	23 57 48.78	119.95	62.45	4 11 32.3	+640.7	
	Moon II. U.	21.9	0 21 53.52	120.92	62.71	2 1 30.1	658.8	
	20 Ceti -	5	0 45 21.29			S. 1 58		
	ε Piscium *	5	1 0 39.53			N. 4 51		
2	20 Ceti -	5	0 45 21.32			S. 1 58		
	ε Piscium *	5	1 0 39.56			N. 4 51		
	Moon II. L.	-	0 46 13.18	122.45	63.12	0 11 34.1	+670.9	
	Moon II. U.	23.0	1 10 54.58	124.55	63.67	2 26 26.0	676.6	
	μ Piscium *	4½	1 22 20.37			5 22		
	ν Piscium *	5	1 33 38.23			N. 4 44		
3	μ Piscium *	4½	1 22 20.40			N. 5 22		
	ν Piscium *	5	1 33 38.26			4 44		
	Moon II. L.	-	1 36 4.81	127.26	64.37	4 41 42.0	+674.8	
	Moon II. U.	24.0	2 1 51.07	130.55	65.22	6 55 48.4	664.7	
	ν Ceti - *	4½	2 28 0.66			4 56		
	B.A.C. 845*	4	2 36 50.62			N. 9 29		
4	ν Ceti - *	4½	2 28 0.69			N. 4 56		
	B.A.C. 845*	4	2 36 50.65			9 29		
	Moon II. L.	-	2 28 20.33	134.42	66.19	9 6 57.7	+645.1	
	Moon II. U.	25.0	2 55 39.15	138.80	67.28	11 13 8.0	614.7	
	ξ Tauri - *	4	3 19 2.88			9 12		
	ε Tauri - *	5	3 40 3.00			N. 10 41		
5	Moon II. L.	-	3 23 53.10	143.58	68.45	N. 13 12 1.3	+572.1	
	Moon II. U.	26.1	3 53 6.07	148		15 1 5.0	516.2	
6	Moon II. L.	-	4 23 19.70			16 37 34.9	+446.4	
	Moon II. U.	27.1	4 54 32			17 58 42.2	362.5	
7	Moon II. L.	-	5 26 4			1	+265.4	
	Moon II. U.	28.2	5 59 32				157.2	
8	Moon II. L.	-	6 32				41.2	
	Moon II. U.	29.2	7 6				78.5	

# 526 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of C's D in 1 h of Lon.
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.		
1850. July 9	Moon I. L.	- -	<sup>h</sup> <sup>m</sup> <sup>s</sup> 7 37 53 '65	<sup>s</sup> 168 '08	<sup>s</sup> 74 '19	<sup>°</sup> <sup>'</sup> <sup>"</sup> N.19 32 44 '7	-197	
10	Moon I. v.	0 '9	8 11 19 '90	166 '09	73 '74	N.18 41 56 '1	-309	
	Moon I. L.	- -	8 44 15 '42	163 '00	73 '04	17 29 30 '8	412	
11	Moon I. v.	2 '0	9 16 28 '74	159 '11	72 '15	N.15 57 47 '7	-502	
	Moon I. L.	- -	9 47 52 '29	154 '76	71 '14	14 9 35 '0	577	
12	Moon I. v.	3 '0	10 18 22 '42	150 '26	70 '09	N.12 7 55 '5	-636	
	Moon I. L.	- -	10 47 58 '88	145 '86	69 '04	9 55 56 '0	680	
13	d Leonis- *	5	10 52 48 '81			N. 4 25		
	χ Leonis- *	4½	10 57 16 '71			8 9		
	Moon I. v.	4 '1	11 16 44 '18	141 '76	68 '06	7 36 35 '3	-710	
	Moon I. L.	- -	11 44 42 '85	138 '10	67 '17	5 12 40 '2	726	
	ν Virginis *	4½	11 38 9 '23			7 22		
	β Virginis -	3½	11 42 53 '28			N. 2 37		
14	ν Virginis *	4½	11 38 9 '23			N. 7 22		
	β Virginis -	3½	11 42 53 '27			2 37		
	Moon I. v.	5 '1	12 12 0 '68	134 '96	66 '39	2 46 41 '1	-731	
	Moon I. L.	- -	12 38 44 '20	132 '39	65 '75	N. 0 20 51 '5	725	
	γ Virginis -	4	12 34 4 '36			S. 0 38		
	δ Virginis *	3	12 48 3 '54			N. 4 13		
15	γ Virginis -	4	12 34 4 '35			S. 0 38		
	δ Virginis *	3	12 48 3 '53			N. 4 13		
	Moon I. v.	6 '1	13 5 0 '17	130 '37	65 '24	S. 2 2 49 '8	-710	
	Moon I. L.	- -	13 30 55 '34	128 '91	64 '86	4 22 38 '7	686	
	α Virginis -	1	13 17 18 '75			S.10 23		
	ζ Virginis -	4	13 27 4 '17			N. 0 10		
16	α Virginis -	1	13 17 18 '73			S.10 23		
	ζ Virginis -	4	13 27 4 '16			N. 0 10		
	Moon I. v.	7 '2	13 56 36 '05	127 '96	64 '61	S. 6 37 3 '7	-656	
	Moon I. L.	- -	14 22 8 '17	127 '47	64 '47	8 44 42 '3	619	
	λ Virginis -	4	14 11 1 '34			12 41		
	μ Virginis -	4½	14 35 11 '10			S. 5 0		
17	λ Virginis -	4	14 11 1 '33			S.12 41		
	μ Virginis -	4½	14 35 11 '09			5 0		
	Moon I. v.	8 '2	14 47 36 '86	127 '38	64 '43	10 44 20 '2	-576	
	Moon I. L.	- -	15 13 6 '48	127 '61	64 '47	12 34 49 '2	527	
	β Libræ -	2	15 8 58 '01			8 50		
	γ Libræ -	4½	15 27 10 '26			S.14 17		
18	β Libræ -	2	15 8 58 '00			S. 8 50		
	γ Libræ -	4½	15 27 10 '25			14 17		
	Moon I. v.	9 '2	15 38 40 '48	128 '09	64 '56	14 15 7 '4	-471	
	Moon I. L.	- -	16 4 21 '29	128 '73	64 '70	S.15 44 17 '6	-411	



# MOON-CULMINATING STARS.

527

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of C's Dec. in 1 hour of Long.
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.		
850. July 18	$\delta$ Scorpii -	3	<sup>h</sup> 15 <sup>m</sup> 51 <sup>s</sup> 30.31	" "	"	S. 22 11 "	"	
	$\beta^1$ Scorpii -	2	15 56 45.28			19 23		
19	$\delta$ Scorpii -	3	15 51 30.30			S. 22 11		
	$\beta^1$ Scorpii -	2	15 56 45.27			19 23		
	Moon I. v.	10.3	16 30 10.23	129.43	64.84	17 1 27.7	-354.5	
	Moon I. L.	-	16 56 7.60	130.11	64.98	18 5 51.9	289.0	
	$\eta$ Ophiuchi -	2½	17 1 48.91			15 32		
	$\theta$ Ophiuchi -	3½	17 12 50.44			S. 24 51		
20	$\eta$ Ophiuchi -	2½	17 1 48.90			S. 15 32		
	$\theta$ Ophiuchi -	3½	17 12 50.43			24 51		
	Moon I. v.	11.3	17 22 12.50	130.68	65.09	18 56 51.1	-220.5	
	Moon I. L.	-	17 48 23.09	131.05	65.15	19 33 54.6	149.8	
	$\sigma$ Serpentis -	4½	17 33 1.44			12 47		
	$\mu^1$ Sagittarii -	4	18 4 49.98			S. 21 5		
21	$\sigma$ Serpentis -	4½	17 33 1.44			S. 12 47		
	$\mu^1$ Sagittarii -	4	18 4 49.98			21 5		
	Moon I. v.	12.3	18 14 36.73	131.17	65.14	19 56 40.9	-77.8	
	Moon I. L.	-	18 40 50.08	131.00	65.06	20 4 58.9	5.3	
	$\sigma$ Sagittarii -	3	18 46 0.34			26 29		
	$\sigma$ Sagittarii -	4½	18 55 43.82			S. 21 57		
22	$\sigma$ Sagittarii -	3	18 46 0.34			S. 26 29		
	$\sigma$ Sagittarii -	4½	18 55 43.83			21 57		
	Moon I. v.	13.4	19 6 59.49	130.52	64.91	19 58 49.8	+66.6	
	Moon I. L.	-	19 33 1.26	129.73	64.69	19 38 25.4	137.1	
	$h^2$ Sagittarii -	4½	19 27 36.96			25 13		
	$e^2$ Sagittarii -	5	19 33 58.54			S. 16 28		
23	$h^2$ Sagittarii -	4½	19 27 36.97			S. 25 13		
	$e^2$ Sagittarii -	5	19 33 58.54			16 28		
	Moon I. v.	14.4	19 58 51.93	128.68	64.41	19 4 8.8	+205.2	
	$\alpha^2$ Capricorni	3½	20 9 46.01			13 0		
	$\beta$ Capricorni	3½	20 12 37.08			S. 15 15		
24	$\alpha^2$ Capricorni	3½	20 9 46.02			S. 13 0		
	$\beta$ Capricorni	3½	20 12 37.09			15 15		
	Moon II. L.	-	20 26 36.76	127.35	64.07	18 16 33.0	+270.1	
	Moon II. v.	15.4	20 51 56.56	125.93	63.71	17 16 21.1	331.2	
	$\epsilon$ Capricorni	5	21 28 42.71			20 8		
	$\kappa$ Capricorni	5	21 34 18.73			S. 19 33		
25	$\epsilon$ Capricorni	5	21 28 42.72			S. 20 8		
	$\kappa$ Capricorni	5	21 34 18.75			19 33		
	Moon II. L.	-	21 16 58.89	124.45	63.34	16 4 22.5	+387.8	
	Moon II. v.	16.5	21 41 43.52	123.00	62.98	14 41 32.7	+439.7	
	$\theta$ Aquarii -	4½	22 8 56.97			8 32		
	$\sigma$ Aquarii -	5	22 22 44.32			S. 11 27		

# 528 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. C's in 1 of L	
1850.			h. m. s.	s	s	° ' "		
July 26	θ Aquarii -	4½	22 8 56.99			S. 8 32		
	σ Aquarii -	5	22 22 44.34			11 27		
	Moon II. L. -	-	22 6 11.20	121.64	62.64	13 8 50.6	+486	
	Moon II. U. -	17.5	22 30 23.68	120.47	62.36	11 27 18.8	528	
	φ Aquarii -	5	23 6 35.10			6 51		
	ψ Aquarii -	5	23 11 11.14			S. 10 26		
	27	φ Aquarii -	5	23 6 35.12			S. 6 51	
		ψ Aquarii -	5	23 11 11.16			10 26	
		Moon II. L. -	-	22 54 23.57	119.56	62.15	9 38 0.7	+564
		Moon II. U. -	18.5	23 18 14.38	118.97	62.02	7 42 1.0	594
		27 Piscium -	5	23 51 1.30			4 23	
	33 Piscium -	5	23 57 41.07			S. 6 33		
28		27 Piscium -	5	23 51 1.32			S. 4 23	
		33 Piscium -	5	23 57 41.10			6 33	
		Moon II. L. -	-	23 42 0.28	118.75	61.99	5 40 25.2	+620
		Moon II. U. -	19.6	0 5 46.16	118.97	62.08	S. 3 34 19.8	639
	δ Piscium *	5	0 40 55.82			N. 6 46		
20 Ceti -	5	0 45 22.09			S. 1 58			
	29	δ Piscium *	5	0 40 55.85			N. 6 46	
		20 Ceti -	5	0 45 22.12			S. 1 58	
		Moon II. L. -	-	0 29 37.47	119.66	62.30	S. 1 24 53.3	+653
		Moon II. U. -	20.6	0 53 40.13	120.87	62.64	N. 0 46 44.2	661
μ Piscium *		4½	1 22 21.19			5 22		
ο Piscium *	5	1 37 30.06			N. 8 24			
	30	μ Piscium *	4½	1 22 21.22			N. 5 22	
		ο Piscium *	5	1 37 30.09			8 24	
		Moon II. L. -	-	1 18 0.47	122.62	63.12	2 59 17.2	+662
		Moon II. U. -	21.6	1 42 45.18	124.93	63.75	5 11 25.3	657
ξ <sup>1</sup> Ceti - *		5	2 5 4.64			8 8		
ξ <sup>2</sup> Ceti - *	4	2 20 12.58			N. 7 47			
	31	ξ <sup>1</sup> Ceti - *	5	2 5 4.67			N. 8 8	
		ξ <sup>2</sup> Ceti - *	4	2 20 12.61			7 47	
		Moon II. L. -	-	2 8 1.04	127.81	64.51	7 21 40.5	+643
		Moon II. U. -	22.7	2 33 54.84	131.25	65.40	9 28 24.8	622
ο Tauri - *		4½	3 16 45.72			8 30		
ξ Tauri - *	4	3 19 3.67			N. 9 12			
	Aug. 1	ο Tauri - *	4½	3 16 45.75			N. 8 30	
		ξ Tauri - *	4	3 19 3.70			9 12	
		Moon II. L. -	-	3 0 33.01	135.20	66.41	11 29 49.4	+590
		Moon II. U. -	23.7	3 28 1.35	139.59	67.50	13 23 53.4	+548
γ Tauri -		3½	4 11 16.48			15 16		
δ Tauri -	4½	4 15 27.91			N. 17 6			
	2 γ Tauri -	3½	4 11 16.51			N. 15 16		



# MOON-CULMINATING STARS. 529

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.	
1850.			h m s	s	s	° ' "	"	
Aug. 2	♂ <sup>2</sup> Tauri - -	4½	4 15 27.94			N. 17 6		
	Moon II. L. - -	- -	3 56 24.52	144.31	68.67	15 8 23.4	+494.6	
	Moon II. U. - -	24.7	4 25 45.37	149.18	69.84	16 40 55.3	428.6	
	♂ <sup>1</sup> Orionis - -	5	4 44 3.57			14 0		
	♂ Tauri - -	4½	4 54 8.53			N. 21 22		
3	♂ <sup>1</sup> Orionis - -	5	4 44 3.60			N. 14 0		
	♂ Tauri - -	4½	4 54 8.56			21 22		
	Moon II. L. - -	- -	4 56 4.38	153.96	70.98	17 58 58.9	+319.9	
	Moon II. U. - -	25.8	5 27 19.01	158.40	72.01	N. 19 0 3.2	258.8	
4	Moon II. L. - -	- -	5 59 23.26	162.18	72.88	N. 19 41 47.3	+156.8	
	Moon II. U. - -	26.8	6 32 7.54	165.02	73.52	20 2 11.4	+ 46.0	
5	Moon II. L. - -	- -	7 5 19.23	166.71	73.89	N. 19 59 49.9	- 70.2	
	Moon II. U. - -	27.8	7 38 43.48	167.11	73.97	19 34 2.5	187.6	
6	Moon II. L. - -	- -	8 12 4.78	166.23	73.76	N. 18 45 1.1	-301.7	
	Moon II. U. - -	28.9	8 45 8.35	164.19	73.29	17 33 51.2	408.3	
7	Moon I. L. - -	- -	9 15 16.43	161.36	72.61	N. 16 2 27.1	-503.5	
8	Moon I. U. - -	0.6	9 47 11.74	157.78	71.78	N. 14 13 22.3	-584.7	
	Moon I. L. - -	- -	10 18 21.66	153.84	70.86	12 9 36.8	650.1	
9	Moon I. U. - -	1.7	10 48 43.56	149.82	69.92	N. 9 51 23.5	-699.3	
	Moon I. L. - -	- -	11 18 17.78	145.93	69.00	7 30 56.7	732.5	
10	Moon I. U. - -	2.7	11 47 6.91	142.33	68.15	N. 5 2 23.1	-750.7	
	Moon I. L. - -	- -	12 15 15.27	139.14	67.38	2 31 35.5	755.1	
11	c Virginis *	5	12 12 44.03			N. 4 9		
	γ Virginis -	4	12 34 4.08			S. 0 38		
	Moon I. U. - -	3.7	12 42 48.15	136.42	66.73	N. 0 1 9.4	-747.4	
	Moon I. L. - -	- -	13 9 51.40	134.20	66.20	S. 2 26 38.1	728.9	
	θ Virginis -	4½	13 2 11.78			4 44		
	α Virginis -	1	13 17 18.43			S. 10 23		
12	θ Virginis -	4½	13 2 11.77			S. 4 44		
	α Virginis -	1	13 17 18.41			10		
	Moon I. U. - -	4.8	13 36 31.00	132.48	65.78			
	Moon I. L. - -	- -	14 2 52.74	131.22	65.47			
	κ Virginis -	4	14 4 54.94					
	λ Virginis -	4	14 11 0.99					
13	κ Virginis -	4	14 4 54.93					
	λ Virginis -	4	14 11 0.97					
	Moon I. U. - -	5.8	14 29 2.02	130.39	65.5			
	Moon I. L. - -	- -	14 55 3.62	129.93	65.1			
	α <sup>2</sup> Libræ - -	2½	14 42 36.46					

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of C's D in 1 hr of Lon
			Apparent Right Ascension in Time.	Var. of C's R.A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.		
1850. Aug. 13	$\beta$ Libræ - -	2	<sup>h</sup> <sup>m</sup> <sup>s</sup> 15 8 57.67	"	"	<sup>°</sup> <sup>'</sup> <sup>"</sup> S. 8 50 "	"	
14	$\alpha^2$ Libræ - -	2½	14 42 36.45			S. 15 25		
	$\beta$ Libræ - -	2	15 8 57.65			8 50		
	Moon I. v.	6.8	15 21 1.64	129.78	65.11	13 4 57.2	-520	
	Moon I. L.	- -	15 46 59.31	129.86	65.12	14 43 21.5	462	
	$\eta$ Libræ - -	4½	15 35 40.18			15 11		
	$\beta^1$ Scorpii - -	2	15 56 44.94			S. 19 23		
15	$\eta$ Libræ - -	4½	15 35 40.16			S. 15 11		
	$\beta^1$ Scorpii - -	2	15 56 44.92			19 23		
	Moon I. v.	7.9	16 12 58.96	130.10	65.17	16 9 44.3	-400	
	Moon I. L.	- -	16 39 1.96	130.41	65.23	17 23 22.2	335	
	$\phi$ Ophiuchi -	4½	16 22 35.40			16 17		
	B.A.C. 5579	5	16 32 56.02			S. 17 27		
16	$\phi$ Ophiuchi -	4½	16 22 35.39			S. 16 17		
	B.A.C. 5579	5	16 32 56.00			17 27		
	Moon I. v.	8.9	17 5 8.77	130.72	65.28	18 23 39.2	-267	
	Moon I. L.	- -	17 31 18.81	130.94	65.31	19 10 6.4	197	
	$\xi$ Serpentis -	5	17 29 2.11			15 18		
	$\sigma$ Serpentis -	4½	17 33 1.23			S. 12 47		
17	$\xi$ Serpentis -	5	17 29 2.10			S. 15 18		
	$\sigma$ Serpentis -	4½	17 33 1.21			12 47		
	Moon I. v.	9.9	17 57 30.78	131.02	65.29	19 42 23.1	-125	
	Moon I. L.	- -	18 23 42.61	130.91	65.22	20 0 15.6	-53	
	$\lambda$ Sagittarii -	4	18 18 45.20			25 30		
	$\nu^1$ Sagittarii -	5	18 45 9.08			S. 22 55		
18	$\lambda$ Sagittarii -	4	18 18 45.19			S. 25 30		
	$\nu^1$ Sagittarii -	5	18 45 9.07			22 55		
	Moon I. v.	11.0	18 49 51.77	130.58	65.10	20 3 40.6	+ 19	
	Moon I. L.	- -	19 15 55.48	130.00	64.90	19 52 43.7	90	
	$\pi$ Sagittarii -	4½	19 0 52.77			21 15		
	$h^2$ Sagittarii -	4½	19 27 36.97			S. 25 13		
19	$\pi$ Sagittarii -	4½	19 0 52.76			S. 21 15		
	$h^2$ Sagittarii -	4½	19 27 36.96			25 13		
	Moon I. v.	12.0	19 41 50.78	129.18	64.66	19 27 39.8	+160	
	Moon I. L.	- -	20 7 35.09	128.17	64.36	18 48 53.9	227	
	$\alpha^2$ Capricorni	3½	20 9 46.11			13 0		
	$\beta$ Capricorni	3½	20 12 37.19			S. 15 15		
20	$\alpha$ Capricorni	3½	20 9 46.10			S. 13 0		
	$\beta$ Capricorni	3½	20 12 37.18			15 15		
	Moon I. v.	13.0	20 33 6.15	126.99	64.02	17 56 59.2	+291	
	Moon I. L.	- -	20 58 22.34	125.70	63.66	16 52 38.2	+351	
	29 Capricorni	5	21 7 28.89			15 47		
	$\epsilon$ Capricorni	5	21 13 55.81			S. 17 28		



# MOON-CULMINATING STARS. 531

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of ♄'s Dec. in 1 hour of Long.
			Apparent Right Ascension in Time.	Var. of ♄'s R.A. in 1 hour of Long.	Sidereal Time of ♄'s Sem. pas. mer.	Declination.		
1850.			h m s	"	"	° ' "	"	
Aug. 21	29 Capricorni	5	21 7 28.89			S. 15 47		
	♄ Capricorni	5	21 13 55.81			17 28		
	Moon I. v.	14.1	21 23 22.79	124.37	63.30	15 36 39.1	+407.5	
	Moon I. L.	-	21 48 7.40	123.07	62.95	14 9 57.6	458.6	
	♄ Capricorni	3½	21 38 47.86			16 48		
	μ Capricorni	5	21 45 9.31			S. 14 15		
22	♄ Capricorni	3½	21 38 47.86			S. 16 48		
	μ Capricorni	5	21 45 9.31			14 15		
	Moon II. v.	15.1	22 14 42.17	121.82	62.63	12 33 32.7	+504.6	
	σ Aquarii -	5	22 22 44.73			11 27		
	λ Aquarii -	4	22 44 49.57			S. 8 23		
23	σ Aquarii -	5	22 22 44.74			S. 11 27		
	λ Aquarii -	4	22 44 49.58			8 23		
	Moon II. L.	-	22 38 57.61	120.79	62.36	10 48 29.2	+545.1	
	Moon II. v.	16.1	23 3 1.99	119.99	62.16	S. 8 55 53.7	579.9	
	λ Piscium -	5	23 34 25.94			N. 0 57		
	20 Piscium -	5½	23 40 16.12			S. 3 36		
24	λ Piscium -	5	23 34 25.95			N. 0 57		
	20 Piscium -	5½	23 40 16.13			S. 3 36		
	Moon II. L.	-	23 26 58.42	119.47	62.04	6 56 55.7	+608.8	
	Moon II. v.	17.2	23 50 50.60	119.29	62.02	4 52 46.7	631.7	
	33 Piscium -	5	23 57 41.67			6 33		
	10 Ceti - -	6	0 18 58.08			S. 0 53		
25	33 Piscium -	5	23 57 41.69			S. 6 33		
	10 Ceti - -	6	0 18 58.10			0 53		
	Moon II. L.	-	0 14 42.84	119.49	62.10	2 44 40.0	+648.4	
	Moon II. v.	18.2	0 38 39.98	120.11	62.30	S. 0 33 51.7	658.6	
	e Piscium *	5	1 0 41.04			N. 4 51		
	μ Piscium *	4½	1 22 21.89			N. 5 22		
26	e Piscium *	5	1 0 41.06			N. 4 51		
	μ Piscium *	4½	1 22 21.92			5 22		
	Moon II. L.	-	1 2 47.20	121.17	62.62	1 38 20.3	+662.2	
	Moon II. v.	19.2	1 27 10.02	122.71	63.06	3 50 34.2	658.9	
	o Piscium *	5	1 37 30.81			8 24		
	ξ¹ Ceti - - *	5	2 5 5.39			N. 8 8		
27	o Piscium *	5	1 37 30.83			N. 8 24		
	ξ¹ Ceti - - *	5	2 5 5.42			8 8		
	Moon II. L.	-	1 51 54.24	124.74	63.62	6 1 23.9	+648	
	Moon II. v.	20.3	2 17 5.72	127.26	64.31	8 9 18.2	+6	
	ν Ceti - - *	4½	2 28 2.27			4 56		
	B.A.C. 845*	4	2 36 52.25			N. 9 29		
28	ν Ceti - - *	4½	2 28 2.29			N. 4 56		
	B.A.C. 845*	4	2 36 52.28			N. 9 29		

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of R.A. in 1 hour of Long.	Sidereal Time of Transit of Sem. pas. mer.	Declination.	Var. of R.A. in 1 hour of Long.
			Apparent Right Ascension in Time.								
1850.			h m s								
Aug. 28	Moon II. L.	- -	2 42 50.25	130.24	65.10	N. 10 12 39.6	+602				
	Moon II. U.	21.3	3 9 13.29	133.66	66.00	12 9 43.4	566				
	ζ Tauri - *	4	3 19 4.50			9 12					
	λ Tauri - *	4	3 52 24.05			N. 12 4					
29	ζ Tauri - *	4	3 19 4.53			N. 9 12					
	λ Tauri - *	4	3 52 24.08			12 4					
	Moon II. L.	- -	3 36 19.61	137.45	66.97	13 58 37.0	+520				
	Moon II. U.	22.3	4 4 13.10	141.50	67.98	15 37 20.5	464				
	ε Tauri - -	3½	4 19 53.08			18 51					
	α Tauri - -	1	4 27 20.53			N. 16 12					
30	ε Tauri - -	3½	4 19 53.11			N. 18 51					
	α Tauri - -	1	4 27 20.56			16 12					
	Moon II. L.	- -	4 32 56.12	145.68	69.01	17 3 48.1	+398				
	Moon II. U.	23.4	5 2 29.12	149.80	70.01	18 15 51.5	320				
	ζ Tauri - -	3½	5 28 42.13			21 3					
	132 Tauri - -	5	5 39 49.58			N. 24 31					
31	ζ Tauri - -	3½	5 28 42.16			N. 21 3					
	132 Tauri - -	5	5 39 49.62			24 31					
	Moon II. L.	- -	5 32 50.20	153.66	70.93	19 11 23.8	+233				
	Moon II. U.	24.4	6 3 54.93	157.03	71.72	19 48 27.3	136				
	γ Geminor.	2½	6 29 3.47			16 31					
	ε Geminor.	3	6 34 42.95			N. 25 16					
Sept. 1	γ Geminor.	2½	6 29 3.50			N. 16 31					
	ε Geminor.	3	6 34 42.97			25 16					
	Moon II. L.	- -	6 35 36.06	159.69	72.33	20 5 21.2	+31				
	Moon II. U.	25.4	7 7 44.00	161.47	72.72	N. 20 0 50.3	-77				
2	Moon II. L.	- -	7 40 7.37	162.25	72.88	N. 19 34 14.9	-188				
	Moon II. U.	26.5	8 12 34.03	162.02	72.80	18 45 35.0	297				
3	Moon II. L.	- -	8 44 52.16	160.85	72.50	N. 17 35 34.9	-401				
	Moon II. U.	27.5	9 16 51.25	158.88	72.02	16 5 40.8	496				
4	Moon II. L.	- -	9 48 22.93	156.32	71.41	N. 14 17 57.6	-579				
	Moon II. U.	28.6	10 19 21.34	153.38	70.70	12 14 58.9	648				
5	Moon II. L.	- -	10 49 43.33	150.28	69.96	N. 9 59 39.5	-702				
6	Moon I. U.	0.3	11 17 9.67	147.33	69.23	N. 7 35 4.0	-740				
	Moon I. L.	- -	11 46 19.93	144.42	68.54	5 4 19.8	763				
7	Moon I. U.	1.3	12 14 56.89	141.79	67.90	N. 2 30 28.2	-772				
	Moon I. L.	- -	12 43 4.26	139.50	67.38	S. 0 3 40.4	767				
8	Moon I. U.	2.4	13 10 46.45	137.59	66.93	S. 2 35 30.3	-749				
	Moon I. L.	- -	13 38 8.04	136.07	66.58	S. 5 2 42.1	-720				



# MOON-CULMINATING STARS. 533

At Greenwich Transit.								
Date.	Name.	Magnitude.	Apparent Right Ascension in Time.	Var. of ☾'s R.A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.	
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
Sept. 9	Moon I. u.	3.4	14 5 13.51	134.90	66.31	S. 7 23 13.8	-682.9	
	Moon I. L.	-	14 32 7.00	134.07	66.14	9 35 19.7	636.8	
	α <sup>2</sup> Libræ -	2½	14 42 36.08			15 25		
	ξ <sup>2</sup> Libræ -	5	14 48 39.00			S. 10 48		
10	α <sup>2</sup> Libræ -	2½	14 42 36.06			S. 15 25		
	ξ <sup>2</sup> Libræ -	5	14 48 38.98			10 48		
	Moon I. u.	4.4	14 58 52.20	133.51	66.02	11 37 30.1	-583.9	
	Moon I. L.	-	15 25 32.10	133.17	65.96	13 28 29.8	525.2	
	η Libræ -	4½	15 35 39.75			15 11		
	θ Libræ -	4½	15 45 18.75			S. 16 17		
11	η Libræ -	4½	15 35 39.73			S. 15 11		
	θ Libræ -	4½	15 45 18.73			16 17		
	Moon I. u.	5.5	15 52 8.94	132.99	65.93	15 7 16.3	-461.8	
	Moon I. L.	-	16 18 44.13	132.89	65.92	16 32 59.0	394.7	
	ν Scorpil -	4	16 3 18.22			19 4		
	φ Ophiuchi -	4½	16 22 34.95			S. 16 17		
12	ν Scorpil -	4	16 3 18.20			S. 19 4		
	φ Ophiuchi -	4½	16 22 34.94			16 17		
	Moon I. u.	6.5	16 45 18.37	132.81	65.90	17 44 58.4	-324.8	
	Moon I. L.	-	17 11 51.46	132.69	65.87	18 42 44.6	252.7	
	η Ophiuchi -	2½	17 1 48.19			15 32		
	θ Ophiuchi -	3½	17 12 49.70			S. 24 51		
13	η Ophiuchi -	2½	17 1 48.17			S. 15 32		
	θ Ophiuchi -	3½	17 12 49.68			24 51		
	Moon I. u.	7.6	17 38 22.57	132.47	65.80	19 25 57.3	-179.3	
	Moon I. L.	-	18 4 50.22	132.11	65.70	19 54 25.2	105.3	
	μ <sup>1</sup> Sagittarii -	4	18 4 49.40			21 5		
	λ Sagittarii -	4	18 18 44.79			S. 25 30		
14	μ <sup>1</sup> Sagittarii -	4	18 4 49.38			S. 21 5		
	λ Sagittarii -	4	18 18 44.77			25 30		
	Moon I. u.	8.6	18 31 12.55	131.58	65.54	20 8 5.8	-31.5	
	Moon I. L.	-	18 57 27.44	130.87	65.33	20 7 5.6	+ 41.4	
	ο Sagittarii -	4½	18 55 43.40			21 57		
	π Sagittarii -	4½	19 0 52.42			S. 21 15		
15	ο Sagittarii -	4½	18 55 43.38			S. 21 57		
	π Sagittarii -	4½	19 0 52.41			21 15		
	Moon I. u.	9.6	19 23 32.73	129.99	65.07	19 51 38.3	+	
	Moon I. L.	-	19 49 26.47	128.95	64.76	19 22 6.7		
	e <sup>2</sup> Sagittarii -	5	19 33 58.26			16 28		
	α <sup>2</sup> Capricorni	3½	20 9 45.89			S. 13 0		
16	e <sup>2</sup> Sagittarii -	5	19 33 58.25			S. 16 28		
	α <sup>2</sup> Capricorni	3½	20 9 45.87			13 0		
	Moon I. u.	10.7	20 15 6.93	127.78	64.43	S. 18 38		

# 534 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☿'s R.A. in 1 hour of Long.	Sidereal Time of ☿'s Sem. pas. mer.	Declination.	Var. of ☿'s De- clination in 1 hour of Long.	
1850. Sept. 16	Moon I. L.	- -	<sup>h</sup> <sup>m</sup> <sup>s</sup> 20 40 32.97	126.55	64.07	<sup>o</sup> <sup>'</sup> <sup>"</sup> S. 17 42 53.0	<sup>"</sup> +311	
	☿ Capricorni	5	20 55 54.08			20 27		
	♊ Aquarii -	5	21 1 27.46			S. 11 59		
17	☿ Capricorni	5	20 55 54.07			S. 20 27		
	♊ Aquarii -	5	21 1 27.45			11 59		
	Moon I. u.	11.7	21 5 44.03	125.29	63.70	16 34 30.0	+371	
	Moon I. L.	- -	21 30 40.11	124.07	63.36	15 14 38.5	426	
	♋ Capricorni	3½	21 38 47.84			16 48		
	♌ Capricorni	5	21 45 9.31			S. 14 15		
18	♋ Capricorni	3½	21 38 47.84			S. 16 48		
	♌ Capricorni	5	21 45 9.30			14 15		
	Moon I. u.	12.7	21 55 21.98	122.94	63.02	13 44 11.6	+477	
	Moon I. L.	- -	22 19 51.13	121.95	62.73	12 4 6.9	522	
	♌ Aquarii -	4½	22 8 57.38			8 32		
	♍ Aquarii -	5	22 22 44.81			S. 11 27		
19	♌ Aquarii -	4½	22 8 57.38			S. 8 32		
	♍ Aquarii -	5	22 22 44.80			11 27		
	Moon I. u.	13.8	22 44 9.55	121.16	62.51	10 15 26.7	+563	
	Moon I. L.	- -	23 8 20.01	120.62	62.35	S. 8 19 16.5	597	
	♎ Piscium -	4½	23 9 25.96			N. 2 28		
	♏ Piscium *	5	23 20 24.30			N. 5 33		
20	♎ Piscium -	4½	23 9 25.96			N. 2 28		
	♏ Piscium *	5	23 20 24.31			N. 5 33		
	Moon I. u.	14.8	23 32 25.66	120.37	62.28	S. 6 16 47.2	+626	
	Moon II. L.	- -	23 58 34.86	120.46	62.30	4 9 12.7	648	
	27 Piscium -	5	23 51 2.16			4 23		
	33 Piscium -	5	23 57 41.97			S. 6 33		
21	27 Piscium	5	23 51 2.17			S. 4 23		
	33 Piscium -	5	23 57 41.98			6 33		
	Moon II. u.	15.8	0 22 42.76	120.92	62.44	1 57 51.0	+66	
	20 Ceti - -	5	0 45 23.17			S. 1 58		
	♐ Piscium *	5	1 0 41.48			N. 4 51		
22	20 Ceti - -	5	0 45 23.18			S. 1 58		
	♐ Piscium *	5	1 0 41.49			N. 4 51		
	Moon II. L.	- -	0 46 58.42	121.76	62.67	0 15 55.0	+67	
	Moon II. u.	16.9	1 11 26.59	123.00	63.03	2 30 38.1	67	
	♐ Piscium *	5	1 33 40.30			4 44		
	♑ Piscium *	5	1 37 31.33			N. 8 24		
23	♐ Piscium *	5	1 33 40.32			N. 4 44		
	♑ Piscium *	5	1 37 31.35			8 24		
	Moon II. L.	- -	1 36 12.14	124.66	63.49	4 44 47.1	+66	
	Moon II. u.	17.9	2 1 20.05	126.73	64.07	6 56 44.9	+65	
	♒ Ceti - - *	4	2 20 13.97			N. 7 47		



# MOON-CULMINATING STARS. 535

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☿'s R. A. in 1 hour. of Long.	Sidereal Time of ☿'s Sem. pas. mer.	Declination.	Var. of ☿'s Dec. in 1 hour of Long.	
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
Sept. 23	☿ Ceti - - *	4½	2 28 2'88			N. 4 56		
24	ξ Ceti - - *	4	2 20 13'99			N. 7 47		
	☿ Ceti - - *	4½	2 28 2'90			4 56		
	Moon II. L. - -		2 26 55'15	129'19	64'75	9 4 49'7	+627'8	
	Moon II. v. 18'9		2 53 2'00	132'01	65'50	11 7 14'8	594'9	
	♄ Tauri - - *	4½	3 16 47'23			8 30		
	ξ Tauri - - *	4	3 19 5'19			N. 9 12		
25	♄ Tauri - - *	4½	3 16 47'25			N. 8 30		
	ξ Tauri - - *	4	3 19 5'21			9 12		
	Moon II. L. - -		3 19 44'62	135'14	66'34	13 2 8'3	+552'5	
	Moon II. v. 20'0		3 47 6'19	138'49	67'21	14 47 35'3	500'4	
	ε Tauri - - -	3½	4 19 53'87			18 51		
	α Tauri - - -	1	4 27 21'31			N. 16 12		
26	ε Tauri - - -	3½	4 19 53'90			N. 18 51		
	α Tauri - - -	1	4 27 21'33			16 12		
	Moon II. L. - -		4 15 8'78	141'96	68'10	16 21 37'6	+438'4	
	Moon II. v. 21'0		4 43 53'01	145'40	68'98	17 42 17'5	366'7	
	♄ Tauri - - -	5	5 18 39'79			21 48		
	ζ Tauri - - -	3½	5 28 42'96			N. 21 3		
27	♄ Tauri - - -	5	5 18 39'83			N. 21 48		
	ζ Tauri - - -	3½	5 28 42'99			21 3		
	Moon II. L. - -		5 13 17'63	148'66	69'79	18 47 41'0	+285'7	
	Moon II. v. 22'0		5 43 19'47	151'57	70'50	19 36 1'8	196'5	
	γ Geminor. 2½		6 29 4'26			16 31		
	ε Geminor. 3		6 34 43'77			N. 25 16		
28	γ Geminor. 2½		6 29 4'29			N. 16 31		
	ε Geminor. 3		6 34 43'81			25 16		
	Moon II. L. - -		6 13 53'38	153'98	71'08	20 5 48'5	+100'3	
	Moon II. v. 23'1		6 44 52'30	155'72	71'49	20 15 47'7	- 1'1	
	ζ Geminor. 4		6 55 14'07			20 47		
	δ Geminor. 3½		7 11 11'05			N. 22 15		
29	ζ Geminor. 4		6 55 14'10			N. 20 47		
	δ Geminor. 3½		7 11 11'08			22		
	Moon II. L. - -		7 16 7'74	156'72	71'71			
	Moon II. v. 24'1		7 47 30'44	156'93	71'74			
	♄ Cancri - -	5½	8 23 3'12					
	δ Cancri - -	4½	8 36 10'05					
30	♄ Cancri - -	5½	8 23 3'14					
	δ Cancri - -	4½	8 36 10'07					
	Moon II. L. - -		8 18 51'12	156'39	71'71			
	Moon II. v. 25'1		8 50 1'21	155'19	71'71			
	ξ Leonis - *	5	9 23 52'00					
	♄ Leonis - *	4	9 33 9'17					

Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of C's Dec in 1 hour of Lon.
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.		
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>s</sup>	
Oct. 1	Moon II. L.	- -	9 20 53.54	153.46	70.82	N. 15 59 11.2	-495	
	Moon II. U.	26.2	9 51 22.72	151.36	70.28	14 11 59.6	571	
2	Moon II. L.	- -	10 21 25.41	149.07	69.70	N. 12 10 14.7	-641	
	Moon II. U.	27.2	10 51 0.19	146.74	69.10	9 56 24.7	695	
3	Moon II. L.	- -	11 20 7.44	144.50	68.54	N. 7 33 9.2	-735	
	Moon II. U.	28.3	11 48 48.88	142.45	68.02	5 3 14.3	761	
4	Moon II. L.	- -	12 17 7.28	140.67	67.57	N. 2 29 27.7	-773	
	Moon I. U.	29.3	12 42 51.79	139.25	67.21	S. 0 5 26.8	773	
5	Moon I. L.	- -	13 10 35.44	138.08	66.92	S. 2 38 52.3	-759	
6	Moon I. U.	0.9	13 38 6.95	137.22	66.73	S. 5 8 20.6	-733	
	Moon I. L.	- -	14 5 29.83	136.64	66.61	7 31 37.0	697	
7	Moon I. U.	1.9	14 32 47.14	136.28	66.54	S. 9 46 40.3	-651	
	Moon I. L.	- -	15 0 1.29	136.10	66.54	11 51 43.1	597	
8	Moon I. U.	3.0	15 27 13.94	136.02	66.55	S. 13 45 14.5	-536	
	Moon I. L.	- -	15 54 25.89	135.97	66.58	15 25 58.5	469	
9	♂ Scorpii	3	15 51 29.07			S. 22 11		
	♂ Scorpii	2	15 56 44.07			19 23		
	Moon I. U.	4.0	16 21 37.11	135.89	66.59	16 52 54.1	-398	
	Moon I. L.	- -	16 48 46.76	135.70	66.57	18 5 15.3	324	
	B.A.C. 5579	5	16 32 55.11			17 27		
	η Ophiuchi	2½	17 1 47.73			S. 15 32		
10	B.A.C. 5579	5	16 32 55.10			S. 17 27		
	η Ophiuchi	2½	17 1 47.71			15 32		
	Moon I. U.	5.1	17 15 53.30	135.36	66.51	19 2 30.8	-248	
	Moon I. L.	- -	17 42 54.64	134.82	66.39	19 44 22.7	170	
	58 Ophiuchi	5	17 34 27.77			21 36		
	μ¹ Sagittarii	4	18 4 48.90			S. 21 5		
11	58 Ophiuchi	5	17 34 27.75			S. 21 36		
	μ¹ Sagittarii	4	18 4 48.88			21 5		
	Moon I. U.	6.1	18 9 48.25	134.08	66.22	20 10 44.8	-93	
	Moon I. L.	- -	18 36 31.67	133.12	65.98	20 21 43.3	-16	
	ξ² Sagittarii	4	18 48 48.15			21 18		
	ο Sagittarii	4½	18 55 42.91			S. 21 57		
12	ξ² Sagittarii	4	18 48 48.14			S. 21 18		
	ο Sagittarii	4½	18 55 42.89			21 57		
	Moon I. U.	7.1	19 3 2.31	131.96	65.69	20 17 33.8	+58	
	Moon I. L.	- -	19 29 18.04	130.64	65.35	19 58 40.6	+130	
	ρ¹ Sagittarii	5	19 12 59.62			18 7		
	κ² Sagittarii	4½	19 27 36.16			S. 25 13		



# MOON-CULMINATING STARS. 537

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☿'s R. A. in 1 hour of Long.	Sidereal Time of ☿'s Sem. pas. mer.	Declination.	Var. of ☿'s Dec. in 1 hour of Long.	
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
Oct. 13	ρ <sup>1</sup> Sagittarii -	5	19 12 59.60			S. 18 7		
	h <sup>2</sup> Sagittarii -	4½	19 27 36.14			25 13		
	Moon I. u.	8.2	19 55 17.18	129.20	64.96	19 25 35.3	+199.9	
	Moon I. L.	- -	20 20 58.64	127.70	64.56	18 38 55.9	266.1	
	α <sup>2</sup> Capricorni	3½	20 9 45.46			13 0		
	β Capricorni	3½	20 12 36.54			S. 15 15		
14	α <sup>2</sup> Capricorni	3½	20 9 45.45			S. 13 0		
	β Capricorni	3½	20 12 36.53			15 15		
	Moon I. u.	9.2	20 46 22.04	126.20	64.15	17 39 24.5	+328.5	
	Moon I. L.	- -	21 11 27.80	124.77	63.75	16 27 47.2	387.0	
	ν Aquarii -	5	21 1 27.10			11 59		
	ι Capricorni	5	21 13 55.39			S. 17 28		
15	ν Aquarii -	5	21 1 27.09			S. 11 59		
	ι Capricorni	5	21 13 55.37			17 28		
	Moon I. u.	10.2	21 36 17.04	123.46	63.37	15 4 53.9	+441.2	
	Moon I. L.	- -	22 0 51.58	122.33	63.05	13 31 36.9	490.9	
	ι Aquarii -	4½	21 58 22.07			14 36		
	θ Aquarii -	4½	22 8 57.16			S. 8 32		
16	ι Aquarii -	4½	21 58 22.05			S. 14 36		
	θ Aquarii -	4½	22 8 57.15			8 32		
	Moon I. u.	11.3	22 25 13.96	121.44	62.78	11 48 50.6	+535.9	
	Moon I. L.	- -	22 49 27.25	120.83	62.59	9 57 34.3	576.0	
	λ Aquarii -	4	22 44 49.55			8 23		
	φ Aquarii -	5	23 6 35.68			S. 6 51		
17	λ Aquarii -	4	22 44 49.54			S. 8 23		
	φ Aquarii -	5	23 6 35.67			6 51		
	Moon I. u.	12.3	23 13 35.08	120.53	62.48	7 58 48.7	+610.7	
	Moon I. L.	- -	23 37 41.48	120.60	62.47	5 53 40.2	639.7	
	27 Piscium -	5	23 51 2.18			4 23		
	30 Piscium -	4½	23 54 18.63			S. 6 51		
18	27 Piscium	5	23 51 2.17			S. 4 23		
	30 Piscium -	4½	23 54 18.63			6 51		
	Moon I. u.	13.3	0 1 50.89	121.04	62.57	3 45		
	Moon I. L.	- -	0 26 8.00	121.89	62.78	S. 1		
	δ Piscium *	5	0 40 57.02			N.		
	20 Ceti - -	5	0 45 23.32			S.		
19	δ Piscium *	5	0 40 57.02					
	20 Ceti - -	5	0 45 23.32					
	Moon I. u.	14.4	0 50 37.77	123.14	63.11			
	Moon I. L.	- -	1 15 25.14	124.82	63.51			
	ν Piscium *	5	1 33 40.58					
	ο Piscium *	5	1 37 31.62					
20	ν Piscium *	5	1 33 40.58					

# 538 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☾'s R.A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.	
1850.			h m s	s	s	° ′ ″	″	
Oct. 20	♊ Piscium *	5	1 37 31.63			N. 8 24		
	Moon II. U.	15.4	1 42 43.40	127.02	64.11	5 22 39.7	+681.3	
	ξ Ceti - - *	4	2 20 14.37			7 47		
	ν Ceti - - *	4½	2 28 3.29			N. 4 56		
21	ξ Ceti - - *	4	2 20 14.38			N. 7 47		
	ν Ceti - - *	4½	2 28 3.30			4 56		
	Moon II. L.	- -	2 8 22.25	129.52	64.77	7 37 23.5	+664.4	
	Moon II. U.	16.4	2 34 33.22	132.37	65.52	9 47 47.0	637.8	
	♊ Tauri - *	4½	3 16 47.75			8 30		
	ξ Tauri - *	4	3 19 5.72			N. 9 12		
22	♊ Tauri - *	4½	3 16 47.77			N. 8 30		
	ξ Tauri - *	4	3 19 5.74			9 12		
	Moon II. L.	- -	3 1 20.15	135.50	66.34	11 51 48.9	+600.7	
	Moon II. U.	17.5	3 28 45.91	138.82	67.22	13 47 21.6	552.9	
	λ Tauri - *	4	3 52 25.42			12 4		
	γ Tauri - -	3½	4 11 18.74			N. 15 16		
23	λ Tauri - *	4	3 52 25.44			N. 12 4		
	γ Tauri - -	3½	4 11 18.76			15 16		
	Moon II. L.	- -	3 56 52.15	142.22	68.10	15 32 15.6	+494.3	
	Moon II. U.	18.5	4 25 38.98	145.56	68.97	17 4 21.5	425.0	
	ε Tauri - -	4½	4 54 10.95			21 22		
	15 Orionis -	5	5 1 9.78			N. 15 24		
24	ε Tauri - -	4½	4 54 10.97			N. 21 22		
	15 Orionis -	5	5 1 9.80			15 24		
	Moon II. L.	- -	4 55 4.58	148.66	69.76	18 21 34.8	+345.7	
	Moon II. U.	19.5	5 25 5.16	151.36	70.45	19 22 2.6	257.6	
	μ Geminor.	3	6 13 55.69			22 35		
	ν Geminor.	4	6 20 5.85			N. 20 18		
25	μ Geminor.	3	6 13 55.72			N. 22 35		
	ν Geminor.	4	6 20 5.88			20 18		
	Moon II. L.	- -	5 55 34.89	153.49	70.99	20 4 7.8	+162.2	
	Moon II. U.	20.6	6 26 26.15	154.93	71.36	20 26 35.1	+ 61.7	
	ξ Geminor.	4	6 55 14.91			20 47		
	δ Geminor.	3½	7 11 11.90			N. 22 15		
26	ξ Geminor.	4	6 55 14.95			N. 20 47		
	δ Geminor.	3½	7 11 11.94			22 15		
	Moon II. L.	- -	6 57 30.03	155.58	71.54	20 28 36.6	- 41.7	
	Moon II. U.	21.6	7 28 37.01	155.45	71.52	20 9 54.3	145.2	
	κ Geminor.	4	7 35 25.25			24 45		
	φ Geminor.	5	7 44 20.72			N. 27 9		
27	κ Geminor.	4	7 35 25.29			N. 24 45		
	φ Geminor.	5	7 44 20.75			27 9		
	Moon II. L.	- -	7 59 37.80	154.57	71.31	N. 19 30 42.2	-246.2	



Date.	Name.	Mag- nitude.	At Greenwich Transit.					Var. of ☾'s Dec. in 1 hour of Long.
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.		
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
Oct. 27	Moon II. v.	22.6	8 30 24.06	153.05	70.93	N. 18 31 44.4	—342.4	
	☿ Cancri - *	5	8 59 38.54			11 16		
	ξ Leonis - *	5	9 23 52.71			N. 11 58		
28	☿ Cancri - *	5	8 59 38.57			N. 11 16		
	ξ Leonis - *	5	9 23 52.74			11 58		
	Moon II. L.	-	9 0 49.09	151.05	70.43	17 14 11.7	—431.7	
	Moon II. v.	23.7	9 30 48.07	148.74	69.84	15 39 39.1	512.2	
	α Leonis - *	1½	10 0 23.84			12 42		
	γ Leonis - -	2	10 11 42.76			N. 20 36		
29	α Leonis - *	1½	10 0 23.87			N. 12 42		
	γ Leonis - -	2	10 11 42.79			20 36		
	Moon II. L.	-	10 0 18.42	146.31	69.22	13 49 58.8	—582.7	
	Moon II. v.	24.7	10 29 19.48	143.89	68.60	11 47 17.0	642.3	
	d Leonis - *	5	10 52 49.60			4 25		
	χ Leonis - *	4½	10 57 17.46			N. 8 9		
30	d Leonis - *	5	10 52 49.62			N. 4 25		
	χ Leonis - *	4½	10 57 17.49			8 9		
	Moon II. L.	-	10 57 52.36	141.63	68.00	9 33 48.4	—690.4	
	Moon II. v.	25.8	11 25 59.70	139.64	67.47	7 11 53.9	726.6	
	ν Virginis - *	4½	11 38 9.62			7 22		
	β Virginis -	3½	11 42 53.64			N. 2 37		
31	Moon II. L.	-	11 53 45.02	137.98	67.01	N. 4 43 57.4	—750.8	
	Moon II. v.	26.8	12 21 12.66	136.69	66.66	N. 2 12 23.2	762.9	
Nov. 1	Moon II. L.	-	12 48 27.16	135.79	66.40	S. 0 20 25.9	—763.3	
	Moon II. v.	27.8	13 15 33.17	135.27	66.24	2 52 9.1	752.0	
2	Moon II. L.	-	13 42 34.97	135.09	66.17	S. 5 20 30.1	—729.7	
	Moon II. v.	28.9	14 9 36.48	135.20	66.19	7 43 19.0	696.8	
3	Moon I. L.	-	14 34 28.18	135.52	66.27	S. 9 58 33.8	—654.1	
4	Moon I. v.	0.4	15 1 37.10	135.99	66.40	S. 12 4 20.3	—	
	Moon I. L.	-	15 28 52.04	136.51	66.55	13 58 57.0		
5	Moon I. v.	1.4	15 56 13.09	136.99	66.69	S. 15 40 55		
	Moon I. L.	-	16 23 39.16	137.33	66.80	17 9 0		
6	Moon I. v.	2.5	16 51 8.11	137.46	66.87	S. 18 22		
	Moon I. L.	-	17 18 36.96	137.30	66.86	19 19		
7	Moon I. v.	3.5	17 46 1.98	136.81	66.78	S. 20		
	Moon I. L.	-	18 13 19.14	135.99	66.60	20		
	μ Sagittarii -	4	18 4 48.50			21		
	λ Sagittarii -	4	18 18 43.84			S. 25		

# 540 MOON-CULMINATING STARS.

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec. in 1 hour of Long.	
1850.			h m s	s	s	° ' "	"	
Nov. 8	μ <sup>1</sup> Sagittarii -	4	18 4 48 '49			S. 21 5		
	λ Sagittarii -	4	18 18 43 '83			25 30		
	Moon I. U.	4 '5	18 40 24 '40	134 '83	66 '34	20 37 0 '9	- 8 '9	
	Moon I. L.	- -	19 7 13 '99	133 '39	66 '01	20 31 2 '8	+ 68 '1	
	o Sagittarii -	4½	18 55 42 '46			21 57		
	π Sagittarii -	4½	19 0 51 '48			S. 21 15		
9	o Sagittarii -	4½	18 55 42 '45			S. 21 57		
	π Sagittarii -	4½	19 0 51 '47			21 15		
	Moon I. U.	5 '6	19 33 44 '80	131 '71	65 '60	20 9 58 '2	+ 142 '1	
	Moon I. L.	- -	19 59 54 '48	129 '88	65 '15	19 34 27 '3	212 '4	
	α <sup>2</sup> Capricorni	3½	20 9 45 '03			13 0		
	β Capricorni	3½	20 12 36 '10			S. 15 15		
10	α <sup>2</sup> Capricorni	3½	20 9 45 '02			S. 13 0		
	β Capricorni	3½	20 12 36 '09			15 15		
	Moon I. U.	6 '6	20 25 41 '73	127 '98	64 '67	18 45 16 '5	+ 278 '7	
	Moon I. L.	- -	20 51 6 '17	126 '10	64 '19	17 43 17 '1	340 '5	
	η Capricorni	5	20 55 53 '25			20 27		
	ν Aquarii -	5	21 1 26 '68			S. 11 59		
11	η Capricorni	5	20 55 53 '23			S. 20 27		
	ν Aquarii -	5	21 1 26 '67			11 59		
	Moon I. U.	7 '6	21 16 8 '52	124 '32	63 '73	16 29 23 '1	+ 397 '8	
	Moon I. L.	- -	21 40 50 '50	122 '71	63 '30	15 4 28 '7	450 '5	
	γ Capricorni	4	21 31 48 '21			17 20		
	δ Capricorni	3½	21 38 47 '14			S. 16 48		
12	γ Capricorni	4	21 31 48 '19			S. 17 20		
	δ Capricorni	3½	21 38 47 '12			16 48		
	Moon I. U.	8 '7	22 5 14 '64	121 '36	62 '91	13 29 29 '8	+ 498 '6	
	Moon I. L.	- -	22 29 24 '28	120 '31	62 '61	11 45 21 '8	542 '0	
	σ Aquarii -	5	22 22 44 '26			11 27		
	λ Aquarii -	4	22 44 49 '24			S. 8 23		
13	σ Aquarii -	5	22 22 44 '25			S. 11 27		
	λ Aquarii -	4	22 44 49 '23			8 23		
	Moon I. U.	9 '7	22 53 23 '44	119 '62	62 '44	9 53 1 '0	+ 580 '7	
	Moon I. L.	- -	23 17 16 '71	119 '33	62 '35	7 53 25 '2	614 '5	
	φ Aquarii -	5	23 6 35 '40			6 51		
	ψ <sup>2</sup> Aquarii -	5	23 11 11 '48			S. 10 26		
14	φ Aquarii -	5	23 6 35 '39			S. 6 51		
	ψ <sup>2</sup> Aquarii -	5	23 11 11 '47			10 26		
	Moon I. U.	10 '7	23 41 9 '14	119 '48	62 '37	5 47 34 '3	+ 643 '1	
	Moon I. L.	- -	0 5 6 '18	120 '10	62 '51	3 36 32 '4	+ 666 '2	
	27 Piscium -	5	23 51 1 '98			4 23		
	33 Piscium -	5	23 57 41 '82			S. 6 33		
15	27 Piscium -	5	23 51 1 '97			S. 4 23		



# MOON-CULMINATING STARS. 541

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☿'s R. A. in 1 hour of Long.	Sidereal Time of ☿'s Sem. pas. mer.	Declination.	Var. of ☿'s Dec. in 1 hour of Long.	
1850.			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	
Nov. 15	33 Piscium -	5	23 57 41 '81			S. 6 33		
	Moon I. v.	11 '8	0 29 13 '60	121 '22	62 '79	S. 1 21 28 '7	+683 '3	
	Moon I. L.	- -	0 53 37 '35	122 '83	63 '19	N. 0 56 20 '3	693 '7	
	20 Ceti - -	5	0 45 23 '25			S. 1 58		
	e Piscium *	5	1 0 41 '64			N. 4 51		
16	20 Ceti - -	5	0 45 23 '24			S. 1 58		
	e Piscium *	5	1 0 41 '64			N. 4 51		
	Moon I. v.	12 '8	1 18 23 '47	124 '94	63 '73	3 15 29 '2	+696 '5	
	Moon I. L.	- -	1 43 37 '97	127 '56	64 '39	5 34 21 '9	690 '8	
	α Piscium -	3½	1 54 20 '48			2 2		
	ξ <sup>1</sup> Ceti - - *	5	2 5 6 '48			N. 8 8		
17	α Piscium -	3½	1 54 20 '48			N. 2 2		
	ξ <sup>1</sup> Ceti - - *	5	2 5 6 '48			8 8		
	Moon I. v.	13 '8	2 9 26 '65	130 '63	65 '18	7 51 11 '0	+675 '7	
	Moon I. L.	- -	2 35 54 '75	134 '12	66 '06	10 3 57 '1	650 '1	
	ν Ceti - - *	4½	2 28 3 '48			4 56		
	B.A.C. 845*	4	2 36 53 '55			N. 9 29		
18	ν Ceti - - *	4½	2 28 3 '49			N. 4 56		
	B.A.C. 845*	4	2 36 53 '55			9 29		
	Moon I. v.	14 '9	3 3 6 '69	137 '92	67 '02	12 10 28 '1	+613 '1	
	Moon I. L.	- -	3 31 5 '69	141 '93	68 '03	14 8 22 '9	563 '9	
	o Tauri - *	4½	3 16 48 '08			8 30		
	ξ Tauri - *	4	3 19 6 '06			N. 9 12		
19	o Tauri - *	4½	3 16 48 '09			N. 8 30		
	ξ Tauri - *	4	3 19 6 '06			9 12		
	Moon II. v.	15 '9	4 2 11 '31	146 '15	69 '04	15 55 13 '0	+502 '3	
	ε Tauri - -	3½	4 19 55 '07			18 51		
	α Tauri - -	1	4 27 22 '52			N.16 12		
20	ε Tauri - -	3½	4 19 55 '08			N.18 51		
	α Tauri - -	1	4 27 22 '53			16 12		
	Moon II. L.	- -	4 31 48 '65	150 '03	70 '00	17 28 28 '6	+422 '0	
	Moon II. v.	16 '9	5 2 10 '46	153 '52	70 '88	18 45 45 '0		
	ζ Tauri - -	3½	5 28 44 '44			21 3		
	ν Orionis - -	4½	5 59 3 '76			N.14 47		
21	ζ Tauri - -	3½	5 28 44 '47			N.21 3		
	ν Orionis - -	4½	5 59 3 '78			14 47		
	Moon II. L.	- -	5 33 10 '59	156 '38	71 '60	19 4		
	Moon II. v.	18 '0	6 4 40 '36	158 '42	72 '12	20 4		
	μ Geminor.	3	6 13 56 '48			22		
	γ Geminor.	2½	6 29 5 '85			N.16		
22	μ Geminor.	3	6 13 56 '50			N		
	γ Geminor.	2½	6 29 5 '88					
	Moon II. L.	- -	6 36 28 '84	159 '48	72 '41	!		

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of ☾'s R. A. in 1 hour of Long.	Sidereal Time of ☾'s Sem. pas. mer.	Declination.	Var. of ☾'s Dec in 1 hour of Long.	
1850. Dec. 11	Moon I. L.	- -	<sup>h</sup> <sup>m</sup> <sup>s</sup> 23 44 37·26	<sup>s</sup> 117·53	<sup>s</sup> 61·96	<sup>°</sup> <sup>'</sup> <sup>"</sup> S. 5 43 51·6	<sup>"</sup> +638·	
	27 Piscium -	5	23 51 1·69			4 23		
	33 Piscium -	5	23 57 41·53			S. 6 33		
12	27 Piscium -	5	23 51 1·67			S. 4 23		
	33 Piscium -	5	23 57 41·52			6 33		
	Moon I. U.	9·1	0 8 9·89	118·00	62·09	3 33 59·1	+659·	
	Moon I. L.	- -	0 31 51·36	119·01	62·36	S. 1 20 22·7	675·	
	♂ Piscium *	5	0 40 56·71			N. 6 46		
	20 Ceti - -	5	0 45 23·03			S. 1 58		
13	♂ Piscium *	5	0 40 56·70			N. 6 46		
	20 Ceti - -	5	0 45 23·02			S. 1 58		
	Moon I. U.	10·1	0 55 48·47	120·60	62·78	N. 0 55 50·1	+685·	
	Moon I. L.	- -	1 20 8·16	122·78	63·34	3 13 25·1	689·	
	ν Piscium *	5	1 33 40·49			4 44		
	ο Piscium *	5	1 37 31·55			N. 8 24		
14	ν Piscium *	5	1 33 40·48			N. 4 44		
	ο Piscium *	5	1 37 31·54			8 24		
	Moon I. U.	11·2	1 44 57·55	125·55	64·06	5 30 57·8	+685·	
	Moon I. L.	- -	2 10 23·66	128·90	64·91	7 46 51·7	672·	
	ξ <sup>1</sup> Ceti - - *	5	2 5 6·39			8 8		
	ξ <sup>2</sup> Ceti - - *	4	2 20 14·49			N. 7 47		
15	ξ <sup>1</sup> Ceti - - *	5	2 5 6·39			N. 8 8		
	ξ <sup>2</sup> Ceti - - *	4	2 20 14·49			7 47		
	Moon I. U.	12·2	2 36 33·20	132·78	65·89	9 59 17·1	+650	
	Moon I. L.	- -	3 3 32·20	137·13	66·97	12 6 8·9	616	
	ο Tauri - *	4½	3 16 48·16			8 30		
	ξ Tauri - *	4	3 19 6·14			N. 9 12		
16	ο Tauri - *	4½	3 16 48·16			N. 8 30		
	ξ Tauri - *	4	3 19 6·14			9 12		
	Moon I. U.	13·2	3 31 25·56	141·81	68·11	14 5 7·6	+571	
	Moon I. L.	- -	4 0 16·38	146·67	69·29	15 53 39·4	512	
	γ Tauri - -	3½	4 11 19·45			15 16		
	ε Tauri - -	3½	4 19 55·32			N. 18 51		
17	γ Tauri - -	3½	4 11 19·45			N. 15 16		
	ε Tauri - -	3½	4 19 55·32			18 51		
	Moon I. U.	14·3	4 30 5·49	151·48	70·44	17 29 2·3	+439	
	Moon I. L.	- -	5 0 50·60	155·96	71·50	18 48 33·0	353	
	ο <sup>1</sup> Orionis -	5	4 44 6·73			14 0		
	ι Tauri - -	4½	4 54 11·91			N. 21 22		
18	ο <sup>1</sup> Orionis -	5	4 44 6·74			N. 14 0		
	ι Tauri - -	4½	4 54 11·91			21 22		
	Moon I. U.	15·3	5 32 25·98	159·80	72·40	19 49 35·7	+255	
	μ Geminor.	3	6 13 57·03			N. 22 35		



# MOON-CULMINATING STARS. 545

Date.	Name.	Mag- nitude.	At Greenwich Transit.					
			Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. of C's Dec. in 1 hour of Long.	
1850. Dec. 18	γ Geminor.	2½	h m s 6 29 6.44	"	"	N. 16° 31' "	"	
19	μ Geminor.	3	6 13 57.05			N. 22 35		
	γ Geminor.	2½	6 29 6.44			16 31		
	Moon II. L.	- -	6 7 8.43	162.82	73.09	20 29 56.0	+146.8	
	Moon II. U.	16.3	6 39 53.84	164.53	73.51	20 47 52.1	+ 31.7	
	ζ Geminor.	4	6 55 16.40			20 47		
	δ Geminor.	3½	7 11 13.45			N. 22 15		
20	ζ Geminor.	4	6 55 16.42			N. 20 47		
	δ Geminor.	3½	7 11 13.47			22 15		
	Moon II. L.	- -	7 12 52.08	164.95	73.63	20 42 26.1	- 86.1	
	Moon II. U.	17.4	7 45 47.41	164.06	73.46	20 13 31.2	202.4	
	θ Cancri - -	5½	8 23 5.62			18 36		
	δ Cancri - -	4½	8 36 12.56			N. 18 42		
21	θ Cancri - -	5½	8 23 5.64			N. 18 36		
	δ Cancri - -	4½	8 36 12.59			18 42		
	Moon II. L.	- -	8 18 24.82	162.00	73.01	19 21 52.0	-312.8	
	Moon II. U.	18.4	8 50 31.57	159.00	72.34	18 8 59.3	414.1	
	κ Cancri - *	5	8 59 40.23			11 16		
	ξ Leonis - *	5	9 23 54.43			N. 11 58		
22	κ Cancri - *	5	8 59 40.26			N. 11 16		
	ξ Leonis - *	5	9 23 54.46			11 58		
	Moon II. L.	- -	9 21 58.15	155.35	71.50	16 37 0.8	-503.4	
	Moon II. U.	19.4	9 52 38.69	151.37	70.58	14 48 29.8	579.4	
	α Leonis - *	1½	10 0 25.56			12 42		
	ρ Leonis - *	4	10 24 57.27			N. 10 5		
23	α Leonis - *	1½	10 0 25.60			N. 12 42		
	ρ Leonis - *	4	10 24 57.31			10 5		
	Moon II. L.	- -	10 22 30.81	147.33	69.62	12 46 12.2	-641.2	
	Moon II. U.	20.5	10 51 35.33	143.47	68.69	10 32 58.0	688.9	
	σ Leonis - *	4	11 13 26.39			6 51		
	τ Leonis - -	4	11 20 15.72			N. 3 41		
24	σ Leonis - *	4	11 13 26.42			N. 6 51		
	τ Leonis - -	4	11 20 15.75			3 41		
	Moon II. L.	- -	11 19 55.41	139.95	67.81	8 11 32		
	Moon II. U.	21.5	11 47 36.04	136.97	67.06	5 44 31		
	η Virginis -	3½	12 12 16.00			N. 0 10		
	γ Virginis -	4	12 34 5.71			S. 0 38		
25	η Virginis -	3½	12 12 16.03			N. 0 10		
	γ Virginis -	4	12 34 5.74			S. 0 38		
	Moon II. L.	- -	12 14 43.30			N. 3 14		
	Moon II. U.	22.6	12 41 23.92			N. 0 43		
	α Virginis -	1	13 17 19.67			10 23		
	ξ Virginis -	4	13 27 4.95			. 0 10		

# 546 MOON-CULMINATING STARS.

At Greenwich Transit.								
Date.	Name.	Magnitude.	Apparent Right Ascension in Time.	Var. of C's R. A. in 1 hour of Long.	Sidereal Time of C's Sem. pas. mer.	Declination.	Var. C's in 1 of L	
1850.			h m s	s	s	° ' "		
Dec. 26	$\alpha$ Virginis -	1	13 17 19.70			S. 10 23		
	$\zeta$ Virginis -	4	13 27 4.98			N. 0 10		
	Moon II. L. -	-	13 7 44.79	131.11	65.54	S. 1 46 44.5	-74	
	Moon II. v. -	23.6	13 33 52.66	130.30	65.30	4 13 42.5	72	
	$\kappa$ Virginis -	4	14 4 55.72			9 34		
	$\lambda$ Virginis -	4	14 11 1.71			S. 12 41		
27	$\kappa$ Virginis -	4	14 4 55.75			S. 9 34		
	$\lambda$ Virginis -	4	14 11 1.74			12 41		
	Moon II. L. -	-	13 59 53.98	130.00	65.20	6 35 54.6	-69	
	Moon II. v. -	24.6	14 25 54.41	130.14	65.20	8 51 42.2	66	
	$\alpha^s$ Libræ -	2½	14 42 36.92			15 25		
	$\beta$ Libræ -	2	15 8 57.83			S. 8 50		
28	$\alpha^s$ Libræ -	2½	14 42 36.95			S. 15 25		
	$\beta$ Libræ -	2	15 8 57.86			8 50		
	Moon II. L. -	-	14 51 58.91	130.66	65.30	10 59 31.9	-61	
	Moon II. v. -	25.7	15 18 11.37	131.45	65.47	12 57 56.1	56	
	$\gamma$ Libræ -	4½	15 35 40.13			15 11		
	$\theta$ Libræ -	4½	15 45 19.05			S. 16 17		
29	Moon II. L. -	-	15 44 34.49	132.42	65.67	S. 14 45 32.3	-50	
	Moon II. v. -	26.7	16 11 9.72	133.45	65.90	16 21 4.0	44	
30	Moon II. L. -	-	16 37 57.00	134.41	66.11	S. 17 43 22.1	-37	
	Moon II. v. -	27.7	17 4 54.94	135.20	66.28	18 51 27.0	30	
31	Moon II. L. -	-	17 32 0.71	135.70	66.38	S. 19 44 30.9	-22	
	Moon II. v. -	28.8	17 59 10.37	135.81	66.40	S. 20 21 59.5	-14	



OCCULTATIONS OF PLANETS AND FIXED STARS BY THE MOON,  
VISIBLE AT GREENWICH.

Day of the Month.	Star's Name.	Magnitude.	Immersion.				Emersion.			
			Sidereal Time.	Mean Time.	Angle from		Sidereal Time.	Mean Time.	Angle from	
					N. Point.	Ver- tex.			N. Point.	Ver- tex.
			h m	h m	°	°	h m	h m	°	°
Jan. 1	45 Leonis - - -	6	13 16	18 30	98	131	14 11	19 25	219	253
4	48 Virginis - - -	6	14 4†	19 56	334	346				
18	27 Piscium - - -	5	1 50†	5 59	206	227				
21	ξ <sup>2</sup> Ceti - - -	4	1 7	5 4	62	47	1 53	5 50	346	340
22	f Tauri - - -	5½	6 4	9 57	70	101	7 0	10 52	319	355
23	γ Tauri - - -	3½	1 15	5 4	132	98	2 17	6 6	264	237
23	71 Tauri - - -	5½	5 8†	8 57	14	26				
23	θ <sup>1</sup> Tauri - - -	4½	5 53	9 42	83	105	7 1	10 49	299	331
23	θ <sup>2</sup> Tauri - - -	4½	6 1	9 49	61	84	6 54	10 43	322	353
23	B.A.C. 1391 - -	5½	6 59	10 47	113	145	8 4	11 52	265	303
23	85 Tauri - - -	6	8 4†	11 52	8	46				
23	α Tauri - - -	1	9 45	13 32	156	196	10 13	14 1	216	256
24	115 Tauri - - -	5½	4 32	8 16	100	87	5 44	9 29	278	285
26	f Geminorum - -	6	7 16†	10 52	355	350				
27	o <sup>1</sup> Cancrī - - -	6	13 36	17 8	122	162	14 14	17 45	208	248
Feb. 1	65 Virginis - - -	6	7 56†	11 9	339	301				
1	66 Virginis - - -	6	8 33†	11 46	338	302				
19	48 Tauri - - -	6	10 8	12 10	106	145	11 2	13 4	269	306
25	45 Leonis - - -	6	14 50	16 28	98	137	15 40	17 17	222	261
25	ρ Leonis - - -	4	17 4	18 41	96	134	17 50†	19 26	229	264
26	χ Leonis - - -	4½	4 43	6 18	120	81	5 22	6 57	209	170
27	10 Virginis - - -	6	9 39	11 9	124	98	10 16	11 46	187	166
Mar. 2	ξ <sup>1</sup> Libræ - - -	6	15 52	17 10	139	150	16 20	17 37	181	196
19	α Tauri - - -	1	0 30†	0 43	196	158				
22	3 Cancri - - -	6	13 2	13 2	62	103	13 55			
23	o <sup>1</sup> Cancri - - -	6	11 34	11 30	78	110	12 39			
23	o <sup>2</sup> Cancri - - -	6	12 8†	12 3	163	200				
28	66 Virginis - - -	6	8 2†	7 39	339	301				
Apr. 1	29 Ophiuchi - -	6	14 21	13 41	50	27				
3	29 Sagittarii - -	6	17 53	17 4	89	80				
5	π Capricorni - -	5	16 17	15 21	99	66				
5	ρ Capricorni - -	5	17 59†	17 2	187	167				
15	α Tauri - - -	1	9 37	8 3	92	13				

## OCCULTATIONS OF PLANETS AND FIXED STARS BY THE MOON,

VISIBLE AT GREENWICH.

Day of the Month.	Star's Name.	Magnitude.	Immersion.				Emersion.			
			Sidereal Time.	Mean Time.	Angle from		Sidereal Time.	Mean Time.	Angle from	
					N. Point.	Ver- tex.			N. Point.	Ver- tex.
Apr. 16	119 Tauri - - -	5½	h m 8 36	h m 6 58	° 157	° 194	h m 9 5	h m 7 27	° 208	° 247
16	120 Tauri - - -	6	9 4	7 26	134	173	9 51	8 13	230	270
21	45 Leonis - - -	6	9 36†	7 38	339	329				
21	ρ Leonis - - -	4	12 42†	10 44	337	4				
22	σ Leonis - - -	4	8 21	6 20	83	53	9 30	7 28	232	211
26	ξ Libræ - - -	6	13 8†	10 50	156	139				
27	η Libræ - - -	4½	12 39†	10 17	339	313				
30	21 Sagittarii - -	6	15 47	13 13	81	59	17 9	14 31	266	255
May 16	d <sup>2</sup> Cancri - - -	6	13 48	10 11	94	134	14 40	11 2	240	279
18	α Leonis - - -	1½	6 55	3 11	109	76	7 52	4 8	217	190
19	JUPITER - - -	-	10 20	6 32	33	24	11 25	7 37	278	283
19	σ Leonis - - -	4	17 32	13 42	127	166	18 1†	14 11	195	232
20	10 Virginis - - -	6	16 19†	12 26	157	193				
24	γ Libræ - - -	4½	19 17†	15 7	167	199				
27	B.A.C. 6098 - -	6	14 59†	10 38	349	323				
28	ξ Sagittarii - -	6	16 14	11 49	91	68	17 35	13 10	262	251
29	f Sagittarii - -	5½	15 27§	10 59	130	96	16 23	11 54	229	201
30	v Capricorni - -	5	17 47	13 14	121	97	19 3	14 30	256	242
June 1	42 Aquarii - - -	6	18 3	13 22	99	65	19 16	14 35	292	265
14	α Leonis - - -	1½	17 2†	11 30	163	200				
15	χ Leonis - - -	4½	17 33	11 57	67	105	18 23†	12 47	256	292
22	29 Ophiuchi - -	6	20 0	13 56	145	173	20 35	14 32	203	235
26	σ Capricorni - -	5½	15 44†	9 26	89	54	16 56	10 37	276	248
28	ι Aquarii - - -	4½	22 54†	16 26	23	32				
29	70 Aquarii - - -	6	19 8	12 37	130	100	20 18	13 47	267	244
July 12	MARS - - -	-	12 49	5 28	86	114	13 54	6 33	229	261
15	65 Virginis - -	6	18 49	11 15	355	34	19 4†	11 30	326	5
21	21 Sagittarii - -	6	18 19	10 22	140	141	19 11	11 13	215	224
24	19 Capricorni - -	6	17 15	9 6	59	29	18 15	10 6	317	294
24	21 Capricorni - -	6	21 14	13 4	84	87	22 30	14 20	310	325
31	ξ Ceti - - -	4	19 28†	10 51	187	149	19 39§	11 2	211	173
Aug. 1	f Tauri - - -	5½	0 19	15 37	120	86	1 27	16 45	284	260
2	γ Tauri - - -	3½	21 24	12 39	134	97	22 10	13 25	257	218



OCCULTATIONS OF PLANETS AND FIXED STARS BY THE MOON,  
VISIBLE AT GREENWICH.

Day of the Month.	Star's Name.	Magnitude.	Immersion.				Emersion.			
			Sidereal Time.	Mean Time.	Angle from		Sidereal Time.	Mean Time.	Angle from	
					N. Point.	Ver- tex.			N. Point.	Ver- tex.
			h m	h m	°	°	h m	h m	°	°
Aug. 2	71 Tauri - - -	5½	0 32†	15 46	18	340				
2	α Tauri - - -	1	5 21	20 34	86	100	6 31	21 44	299	326
3	115 Tauri - - -	5½	1 11	16 21	38	358	1 37	16 47	349	310
14	γ Libræ - - -	4½	18 1	8 30	86	111	19 13	9 41	244	276
18	ξ¹ Sagittarii - -	6	16 31	6 44	102	81	17 52	8 4	252	244
20	ν Capricorni - -	5	18 53†	8 58	189	173				
22	42 Aquarii - - -	6	18 39	8 36	160	130	19 22	9 19	231	205
Sept. 12	29 Ophiuchi - -	6	20 33	9 7	142	173	21 11	9 45	208	242
16	o Capricorni - -	6	23 13	11 31	135	161	0 16	12 34	256	288
18	ι Aquarii - - -	4½	22 44	10 54	58	65	23 30	11 40	348	3
19	70 Aquarii - - -	6	19 13	7 20	148	118	20 10	8 16	249	225
26	α Tauri - - -	1	20 41†	8 20	121	87	21 29	9 8	267	230
29	γ Geminorum - -	6	3 18†	14 44	0	320				
Oct. 1	ψ Leonis - - -	6	2 32	13 50	145	108	2 54	14 12	196	158
2	α Leonis - - -	1½	14 36	1 52	80	119	15 31	2 47	241	281
8	η Libræ - - -	4½	19 18	6 10	69	100	20 23†	7 15	266	303
14	19 Capricorni - -	6	19 25	5 53	122	109	20 45	7 14	264	264
14	21 Capricorni - -	6	23 34	10 1	115	139	0 47	11 14	282	315
21	ξ² Ceti - - -	4	18 48†	4 49	113	78	19 40§	5 40	285	247
21	B.A.C. 845 - - -	4	4 8	14 7	103	122	5 20	15 20	300	331
22	f Tauri - - -	5½	0 7	10 3	32	357	0 19	10 15	13	339
23	γ Tauri - - -	3½	21 23	7 16	35	358	21 41	7 33	357	318
23	75 Tauri - - -	6	1 11	11 3	75	40	2 8	12 0	322	293
24	119 Tauri - - -	5½	5 3†	14 51	10	4				
Nov. 7	B. A. C. 6098 - -	6	21 35	6 29	167	198	21 51	6 45	195	227
8	33 Sagittarii - -	6	20 18	5 8	76	91	21 33	6 22		318
8	ξ² Sagittarii - -	4	22 34	7 23	113	144	23 38†	8 22		398
11	ι Capricorni - -	5	18 24	3 2	120	87	19 41			30
12	45 Aquarii - - -	6	0 52	9 25	53		1 30			31
17	ξ² Ceti - - -	4	7 47†	16 0	17					
21	χ³ Orionis - - -	5	1 12	9 10	123		2 7			
21	68 Orionis - - -	6	5 18	13 15	8		6 30			
23	d¹ Cancri - - -	6	9 53	17 41	10		10 54			

ECCULTATIONS OF PLANETS AND FIXED STARS BY THE MOON  
VISIBLE AT GREENWICH.

Day of the Month.	Star's Name.	Magnitude.	Immersion.				Emersion.			
			Sidereal Time.	Mean Time.	Angle from		Sidereal Time.	Mean Time.	Angle	
					N. Point.	Ver- tex.			N. Point.	
Nov. 27	<i>b</i> Virginis - -	5½	<sup>h</sup> 5 <sup>m</sup> 43	<sup>h</sup> 13 <sup>m</sup> 16	76	37	<sup>h</sup> 6 <sup>m</sup> 40	<sup>h</sup> 14 <sup>m</sup> 13		246
Dec. 15	B.A.C. 845 - -	4	1 56	8 20	164	155	2 46	9 10		247
16	<i>f</i> Tauri - - -	5½	21 34	3 54	89	50	22 28	4 48		311
17	75 Tauri - - -	6	22 17	4 33	98	58	23 11	5 28		296
17	B.A.C. 1391 - -	5½	23 33†	5 49	18	338				
18	119 Tauri - - -	5½	0 28†	6 40	13	332				
18	χ <sup>2</sup> Orionis - - -	6	11 15	17 25	153	193	11 41	17 51		208
22	ψ Leonis - - -	6	2 23†	8 20	351	315				
26	80 Virginis - -	6	10 17	15 56	2	332	10 49	16 27		306

† A near approach.

‡ Star below the horizon.

§ Star Rising.



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ☾ in R. A. of ☾ and *.	At Greenwich Mean Time of ☾			Limiting Parallels.
				Apparent R. A. of ☾ and *.	Apparent Declination of *.	Diff. of Apparent Dec. of ☾ and *.	
			h m s	h m s	° ' "	☾	Latitude.
Jan. 1	α Leonis -	1½	10 0 31	10 0 22.91	N. 12 41 47.5	S. 10 12	26 N. 40 S.
1	45 Leonis -	6	18 12 10	10 19 43.61	10 31 26.9	N. 41 15	89 N. 7 N.
1	ρ Leonis -	4	20 25 40	10 24 54.66	10 4 31.0	46 6	90 N. 12 N.
2	χ Leonis -	4½	10 35 57	10 57 16.60	N. 8 8 40.8	N. 15 54	51 N. 18 S.
2	σ Leonis -	4	17 50 21	11 13 23.86	N. 6 50 59.6	N. 16 14	52 N. 19 S.
3	JUPITER -	-	4 25 22	11 36 30.38	N. 3 56 12.9	75 49	90 N. 54 N.
4	48 Virginis -	6	18 32 1	12 56 10.30	S. 2 51 10.9	N. 65 42	87 N. 36 N.
7	ξ <sup>2</sup> Libræ -	5	2 42 37	14 48 37.15	S. 10 47 56.7	S. 7 10	24 N. 43 S.
7	γ Libræ -	4½	21 58 43	15 27 7.19	S. 14 16 57.4	N. 48 12	76 N. 16 N.
8	48 Libræ -	4½	9 14 32	15 49 46.34	13 50 20.1	S. 57 31	35 S. 90 S.
9	φ Ophiuchi	4½	1 24 37	16 22 32.14	16 16 40.7	S. 9 18	16 N. 46 S.
9	B.A.C. 5579	5	6 28 53	16 32 52.62	S. 17 26 36.7	N. 33 50	65 N. 0
15	μ Capricorni	5	13 41 10	21 45 5.00	S. 14 15 22.3	N. 41 53	76 N. 8 N.
16	σ Aquarii -	5	8 30 46	22 22 40.66	11 26 42.3	N. 22 11	56 N. 13 S.
16	λ Aquarii -	4	19 39 1	22 44 45.66	8 22 38.6	S. 64 42	41 S. 90 S.
17	φ Aquarii -	5	6 39 55	23 6 31.83	S. 6 51 30.2	S. 54 3	23 S. 90 S.
18	27 Piscium -	5	5 9 45	23 50 58.43	S. 4 23 25.7	N. 20 0	57 N. 16 S.
18	29 Piscium -	5	6 45 0	23 54 7.09	3 51 52.1	N. 4 42	10 N. 31 S.
18	SATURN -	-	17 7 43	0 14 43.99	S. 0 56 4.6	S. 63 22	33 S. 90 S.
20	ν Piscium -	5	7 57 33	1 33 37.21	N. 4 43 26.6	N. 10 49	46 N. 24 S.
20	ξ <sup>1</sup> Ceti -	5	22 50 22	2 5 3.11	N. 8 8 17.7	S. 37 47	1 S. 78 S.
21	ξ <sup>2</sup> Ceti -	4	5 51 16	2 20 11.21	7 46 58.3	N. 55 22	90 N. 22 N.
21	B.A.C. 845	4	13 27 10	2 36 50.23	9 28 32.5	29 42	69 N. 4 S.
22	f <sup>1</sup> Tauri -	5½	9 40 42	3 22 36.09	N. 12 25 1.1	N. 41 58	90 N. 10 N.
23	γ Tauri -	3½	6 9 19	4 11 16.18	N. 15 15 30.9	N. 34 40	76 N. 6 N.
23	δ <sup>1</sup> Tauri -	4	7 23 44	4 14 17.71	17 11 2.6	S. 72 7	46 S. 73 S.
23	δ <sup>2</sup> Tauri -	4½	7 52 21	4 15 27.63	17 11 2.6	S. 63 9	30 S. 73 S.
23	71 Tauri -	5½	8 49 55	4 17 48.60	N. 15 15 30.9	N. 34 40	90 N. 24 N.
23	θ <sup>1</sup> Tauri -	4½	9 43 52	4 20 0.98	N. 15 15 30.9	N. 37 1	52 N. 9 N.
23	θ <sup>2</sup> Tauri -	4½	9 46 10	4 20 6.60	15 15 30.9	43 1	50 N. 15 N.
23	B.A.C. 1391	5½	10 31 58	4 23 29.22	15 15 30.9	28 1	57 N. 1 N.
23	85 Tauri -	6	11 4 6	4 23 29.22	N. 15 15 30.9	N. 59 1	57 N. 25 N.
23	α Tauri -	1	12 41 49	4 23 29.22	N. 16 16 1.1	N. 92 1	5 S.
24	115 Tauri -	5½	8 55 24	5 23 29.22	17 11 2.6	34 1	9 N.
24	χ <sup>1</sup> Orionis -	5	19 20 41	5 23 29.22	17 11 2.6	34 1	70 S.
24	χ <sup>2</sup> Orionis -	5	22 48 9	5 23 29.22	N. 19 19 1.1	34 1	53 S.

## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limiting Parallels.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			h m s	h m s	° ′ ″	♄ ° ′ ″	Latitude. ° ′ ″
Jan. 24	χ <sup>4</sup> Orionis -	5	22 58 2	5 55 1'54	N. 20 8 1'7	S. 59 47	25 S. 70 S.
25	ν Geminor.	4	8 26 3	6 20 4'18	20 17 56'9	S. 54 20	18 S. 70 S.
26	f Geminor.	6	10 55 11	7 30 49'64	18 0 30'8	N. 57 5	90 N. 35 N.
27	o <sup>1</sup> Cancri -	6	16 31 53	8 48 53'57	N. 15 53 32'6	N. 37 51	81 N. 9 N.
28	α Leonis -	1½	20 54 40	10 0 23'51	N. 12 41 44'6	S. 5 25	30 N. 35 S.
29	ρ Leonis -	4	7 3 4	10 24 55'33	10 4 27'4	N. 51 34	90 N. 17 N.
29	χ Leonis -	4½	20 47 39	10 57 17'30	8 8 36'9	22 12	58 N. 13 S.
30	σ Leonis -	4	3 47 56	11 13 24'60	N. 6 50 55'2	N. 22 54	59 N. 13 S.
30	JUPITER -	-	12 44 39	11 33 38'94	N. 4 22 42'1	N. 70 52	90 N. 40 N.
Feb. 1	65 Virginis -	6	12 6 46	13 15 32'95	S. 4 8 14'9	49 10	86 N. 13 N.
1	66 Virginis -	6	12 41 31	13 16 45'20	4 22 40'0	57 20	86 N. 23 N.
3	ξ <sup>2</sup> Libræ -	5	9 36 45	14 48 38'00	S. 10 48 1'2	N. 0 10	32 N. 35 S.
4	γ Libræ -	4½	4 36 35	15 27 8'07	S. 14 17 1'4	N. 54 57	76 N. 24 N.
4	48 Libræ -	4½	15 45 57	15 49 47'17	13 50 23'8	S. 51 8	26 S. 90 S.
5	φ Ophiuchi	4½	7 50 19	16 22 32'94	16 16 43'7	S. 3 33	22 N. 39 S.
5	B.A.C. 5579	5	12 53 34	16 32 53'41	S. 17 26 39'4	N. 39 23	73 N. 6 N.
8	d Sagittarii	5	16 5 30	19 8 49'74	S. 19 12 50'0	S. 3 2	14 N. 39 S.
8	ρ <sup>1</sup> Sagittarii	5	18 3 46	19 12 56'47	18 7 23'2	S. 65 41	61 S. 90 S.
14	27 Piscium -	5	10 45 0	23 50 58'23	4 23 26'7	N. 17 55	54 N. 18 S.
14	29 Piscium -	5	12 19 37	23 54 6'88	S. 3 51 53'1	N. 2 36	37 N. 33 S.
16	ν Piscium -	5	13 31 52	1 33 36'85	N. 4 43 25'0	N. 8 23	44 N. 26 S.
17	ξ <sup>1</sup> Ceti -	5	4 34 19	2 5 2'71	8 8 16'1	S. 40 11	4 S. 82 S.
17	ξ <sup>2</sup> Ceti -	4	11 41 36	2 20 10'81	7 46 56'8	N. 53 0	90 N. 20 N.
17	B.A.C. 845	4	19 25 45	2 36 49'82	N. 9 28 31'0	N. 27 23	66 N. 6 S.
19	48 Tauri -	6	11 32 8	4 7 15'65	N. 15 1 6'2	N. 35 25	79 N. 7 N.
19	γ Tauri -	3½	13 14 13	4 11 15'78	15 15 30'1	N. 32 52	74 N. 4 N.
19	δ <sup>1</sup> Tauri -	4	14 31 9	4 14 17'30	17 11 2'0	S. 73 54	54 S. 73 S.
19	δ <sup>2</sup> Tauri -	4½	15 0 44	4 15 27'24	N. 17 5 22'7	S. 64 55	34 S. 73 S.
19	θ <sup>1</sup> Tauri -	4½	16 56 5	4 20 0'57	N. 15 37 19'8	N. 35 54	80 N. 8 N.
19	θ <sup>2</sup> Tauri -	4½	16 58 27	4 20 6'20	15 31 51'2	41 38	90 N. 14 N.
19	α Tauri -	1	20 0 15	4 27 19'14	16 12 2'7	N. 20 51	57 N. 6 S.
21	χ <sup>3</sup> Orionis -	5	7 23 30	5 54 35'20	N. 19 41 5'6	S. 34 23	2 N. 56 S.
21	χ <sup>4</sup> Orionis -	5	7 33 46	5 55 1'23	N. 20 8 2'0	S. 60 56	28 S. 70 S.
21	ν Geminor.	4	17 23 26	6 20 3'92	20 17 57'3	55 19	20 S. 70 S.
25	α Leonis -	1½	7 55 26	10 0 23'77	12 41 43'6	S. 5 32	30 N. 35 S.
25	45 Leonis -	6	15 55 44	10 19 44'57	N. 10 31 22'0	N. 46 28	90 N. 12 N.



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	At Greenwich Mean Time of $\delta$				Limiting Parallels.	
			Greenwich Mean Time of Apparent $\delta$ in R. A. of $\zeta$ and $\ast$ .	Apparent R. A. of $\zeta$ and $\ast$ .	Apparent Declination of $\ast$ .	Diff. of Apparent Dec. of $\zeta$ and $\ast$ .		
			$^{\text{h}}$ $^{\text{m}}$ $^{\text{s}}$	$^{\text{h}}$ $^{\text{m}}$ $^{\text{s}}$	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$
Feb. 25	$\rho$ Leonis -	4	18 5 36	10 24 55.64	N. 10 4 25.9	N. 51 27	90 N. 17 N.	
26	$\chi$ Leonis -	4½	7 47 42	10 57 17.70	8 8 34.8	22 3	58 N. 13 S.	
26	$\sigma$ Leonis -	4	14 44 43	11 13 25.02	6 50 53.0	22 43	59 N. 13 S.	
26	JUPITER -	-	19 5 31	11 23 24.08	N. 5 33 55.4	N. 50 39	90 N. 13 N.	
27	10 Virginis -	6	12 12 21	12 2 1.14	N. 2 44 17.4	N. 23 17	60 N. 13 S.	
Mar. 2	$\xi^1$ Libræ -	6	17 9 30	14 46 15.19	S. 11 16 59.8	N. 38 6	77 N. 2 N.	
2	$\xi^2$ Libræ -	5	18 18 34	14 48 38.79	10 48 4.9	S. 1 9	30 N. 36 S.	
3	$\gamma$ Libræ -	4½	12 51 38	15 27 8.89	S. 14 17 4.8	N. 53 24	76 N. 21 N.	
3	48 Libræ -	4½	23 47 10	15 49 47.99	S. 13 50 26.9	S. 52 48	27 S. 90 S.	
4	$\phi$ Ophiuchi	4½	15 34 40	16 22 33.78	16 16 46.3	S. 5 21	20 N. 41 S.	
4	B.A.C. 5579	5	20 33 23	16 32 54.25	17 26 41.9	N. 37 33	70 N. 4 N.	
7	$d$ Sagittarii	5	23 19 30	19 8 50.43	S. 19 12 49.7	S. 4 52	12 N. 41 S.	
8	$\rho^1$ Sagittarii	5	1 17 52	19 12 57.17	S. 18 7 23.0	S. 67 30	66 S. 90 S.	
9	$\pi$ Capricorni	5	8 58 7	20 18 42.62	18 41 55.5	N. 58 44	71 N. 33 N.	
9	$\rho$ Capricorni	5	9 43 41	20 20 16.74	18 18 17.7	38 21	71 N. 5 N.	
10	29 Capricorni	5	8 38 52	21 7 25.06	S. 15 47 30.1	N. 7 29	34 N. 28 S.	
11	$\mu$ Capricorni	5	3 6 56	21 45 5.41	S. 14 15 20.7	N. 40 50	74 N. 7 N.	
15	$\nu$ Piscium -	5	19 26 15	1 33 36.59	N. 4 43 24.3	N. 12 30	48 N. 23 S.	
16	$\xi^1$ Ceti -	5	10 16 39	2 5 2.39	8 8 15.1	S. 35 27	1 N. 75 S.	
16	$\xi^2$ Ceti -	4	17 19 5	2 20 10.47	N. 7 46 55.9	N. 58 0	90 N. 26 N.	
17	B.A.C. 845 -	4	0 58 45	2 36 49.44	N. 9 28 30.0	N. 32 39	74 N. 1 S.	
18	$\gamma$ Tauri -	3½	18 41 57	4 11 15.30	15 15 29.4	N. 39 8	87 N. 11 N.	
18	$\delta^1$ Tauri -	4	19 59 19	4 14 16.81	17 11 1.2	S. 67 37	39 S. 73 S.	
18	$\delta^2$ Tauri -	4½	20 29 5	4 15 26.76	N. 17 5 22.0	S. 58 38	25 S. 73 S.	
18	$\theta^1$ Tauri -	4½	22 25 12	4 20 0.09	N. 15 37 19.2	N. 42 13	90 N. 14 N.	
18	$\theta^2$ Tauri -	4½	22 27 35	4 20 5.72	15 31 50.5	47 57	90 N. 21 N.	
19	$\alpha$ Tauri -	1	1 30 44	4 27 18.64	16 12 2.1	N. 27 12	66 N. 0	
20	$\chi^1$ Orionis -	5	0 46 8	5 45 30.03	N. 20 14 27.4	S. 70 10	45 S. 70 S.	
20	$\chi^2$ Orionis -	5	0 9	5 54 34.71	N. 19 41 5.8	S. 27 57	8 N. 48 S.	
20	$\chi^3$ Orionis -	5	0 48	5 55 0.74	20 8 2.2	54 31	20 S. 70 S.	
20	$\nu$ Geminor.	4	0 42	6 20 3.45	20 17 57.7	S. 49 1	13 S. 70 S.	
22	3 Cancri -	6	0 10	7 52 11.81	N. 17 42 47.3	N. 51 47	90 N. 29 N.	
23	$\sigma^1$			8 48 53.40	N. 15 53 33.4	N. 42 1	90 N. 14 N.	
23	$\sigma^2$			12.92	16 9 7.9	N. 25 35	63 N. 2 S.	
24	$\alpha$			58	12 41 44.3	S. 2 50	33 N. 33 S.	
25	$\rho$				10 4 26.2	N. 53 27	90 N. 20 N.	

## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limit Paral.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			h m s	h m s	° ' "	♄ ' "	Latit
Mar. 25	χ Leonis -	4½	17 18 59	10 57 17.76	N. 8 8 34.8	N. 23 0	59 N.
25	JUPITER -	-	23 10 52	11 10 39.57	6 55 26.4	32 1	72 N.
26	σ Leonis -	4	0 23 52	11 13 25.12	N. 6 50 52.8	23 6	59 N.
28	66 Virginis -	6	8 34 4	13 16 46.28	S. 4 22 45.9	N. 52 25	86 N.
30	ξ <sup>a</sup> Libræ -	5	3 50 35	14 48 39.41	S. 10 48 7.3	S. 8 16	24 N.
30	γ Libræ -	4½	22 5 3	15 27 9.57	14 17 7.1	N. 45 21	76 N.
31	η Libræ -	4½	2 6 48	15 35 39.78	15 11 24.5	N. 68 34	75 N.
31	48 Libræ -	4½	8 48 59	15 49 48.73	S. 13 50 28.9	S. 61 19	39 S.
Apr. 1	φ Ophiuchi -	4½	0 19 50	16 22 34.56	S. 16 16 48.1	S. 14 24	11 N.
1	B.A.C. 5579	5	5 13 30	16 32 55.05	17 26 43.5	N. 28 21	57 N.
1	29 Ophiuchi -	6	14 46 20	16 53 5.74	18 39 28.0	54 2	71 N.
3	29 Sagittarii	6	17 48 31	18 40 46.08	S. 20 29 20.5	N. 51 51	70 N.
4	d Sagittarii	5	7 12 40	19 8 51.26	S. 19 12 48.6	S. 14 39	3 N.
5	π Capricorni	5	16 52 3	20 18 43.34	18 41 53.3	N. 49 41	71 N.
5	ρ Capricorni	5	17 37 45	20 20 17.45	18 18 15.6	N. 29 20	57 N.
6	29 Capricorni	5	16 38 49	21 7 25.69	S. 15 47 27.5	S. 0 37	26 N.
7	μ Capricorni	5	11 12 30	21 45 5.95	S. 14 15 17.8	N. 33 44	69 N.
8	σ Aquarii -	5	5 50 8	22 22 41.33	11 26 38.4	N. 15 19	48 N.
8	λ Aquarii -	4	16 48 1	22 44 46.14	8 22 36.0	S. 70 35	53 S.
9	φ Aquarii -	5	3 36 21	23 6 32.16	S. 6 51 28.0	S. 58 51	29 S.
10	27 Piscium -	5	1 34 30	23 50 58.45	S. 4 23 24.2	N. 17 47	54 N.
10	29 Piscium -	5	3 7 16	23 54 7.08	S. 3 51 50.8	2 41	38 N.
15	γ Tauri -	3½	0 47 27	4 11 14.94	N. 15 15 29.0	N. 49 0	90 N.
15	δ <sup>1</sup> Tauri -	4	2 3 16	4 14 16.44	N. 17 11 0.6	S. 57 40	23 S.
15	δ <sup>2</sup> Tauri -	4½	2 32 27	4 15 26.39	N. 17 5 21.4	S. 48 39	12 S.
15	δ <sup>3</sup> Tauri -	5	3 6 32	4 16 48.18	17 34 41.6	S. 74 5	53 S.
15	θ <sup>1</sup> Tauri -	4½	4 26 15	4 19 59.71	15 37 18.8	N. 52 19	90 N.
15	θ <sup>2</sup> Tauri -	4½	4 28 36	4 20 5.34	N. 15 31 50.1	N. 58 4	90 N.
15	α Tauri -	1	7 28 13	4 27 18.26	N. 16 12 1.7	N. 37 30	83 N.
16	119 Tauri -	5½	6 22 2	5 23 24.63	18 28 30.2	18 47	56 N.
16	120 Tauri -	6	6 53 58	5 24 43.85	18 25 32.4	N. 23 45	62 N.
16	χ <sup>1</sup> Orionis -	5	15 14 14	5 45 29.57	N. 20 14 27.3	S. 58 16	25 S.
16	χ <sup>2</sup> Orionis -	5	18 52 4	5 54 34.24	N. 19 41 5.8	S. 15 56	20 N.
16	χ <sup>3</sup> Orionis -	5	19 2 28	5 55 0.27	20 8 2.2	42 30	6 S.
17	ν Geminor.	4	5 1 35	6 20 2.94	20 17 58.0	36 43	0
17	ξ Geminor.	4	19 0 57	6 55 12.35	N. 20 47 0.5	S. 65 42	36 S.



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limiting Parallels.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			h m s	h m s	° ' "	♄	Latitude.
Apr. 20	α Leonis	1½	23 13 26	10 0 23.38	N. 12 41 45.8	N. 7 15	43 N. 23 S.
21	45 Leonis	6	7 38 58	10 19 44.27	10 31 23.9	58 1	90 N. 26 N.
21	ρ Leonis	4	9 55 31	10 24 55.36	10 4 27.6	62 40	90 N. 32 N.
22	χ Leonis	4½	0 18 18	10 57 17.55	N. 8 8 36.1	N. 30 54	70 N. 5 S.
22	JUPITER	-	2 16 54	11 1 41.51	N. 7 47 46.1	N. 30 38	70 N. 5 S.
22	σ Leonis	4	7 34 27	11 13 24.97	N. 6 50 53.9	30 15	69 N. 6 S.
26	ξ <sup>1</sup> Libræ	6	11 31 1	14 46 16.20	S. 11 17 3.1	N. 25 50	60 N. 11 S.
26	ξ <sup>2</sup> Libræ	5	12 39 10	14 48 39.80	S. 10 48 8.2	S. 13 37	19 N. 50 S.
27	γ Libræ	4½	6 53 21	15 27 10.08	S. 14 17 8.2	N. 38 0	74 N. 2 N.
27	η Libræ	4½	10 54 20	15 35 40.29	15 11 25.5	N. 60 47	75 N. 31 N.
27	48 Libræ	4½	17 34 49	15 49 49.27	13 50 29.6	S. 69 46	55 S. 90 S.
28	φ Ophiuchi	4½	8 59 41	16 22 35.17	S. 16 16 48.7	S. 24 16	2 N. 64 S.
28	B.A.C. 5579	5	13 51 1	16 32 55.69	S. 17 26 44.2	N. 18 5	44 N. 17 S.
30	21 Sagittarii	6	14 24 20	18 16 26.20	20 36 53.6	N. 50 32	69 N. 20 N.
May 1	δ Sagittarii	5	15 12 34	19 8 52.08	19 12 46.9	S. 28 58	12 S. 73 S.
3	π Capricorni	5	0 48 29	20 18 44.19	S. 18 41 50.2	N. 34 49	65 N. 1 N.
3	ρ Capricorni	5	1 34 16	20 20 18.30	S. 18 18 12.5	N. 14 28	38 N. 21 S.
3	ν Capricorni	5	7 2 0	20 31 30.57	18 39 38.3	N. 60 42	71 N. 35 N.
4	29 Capricorni	5	0 41 18	21 7 26.49	15 47 23.8	S. 15 19	11 N. 53 S.
4	μ Capricorni	5	19 24 10	21 45 6.69	S. 14 15 13.9	N. 19 32	50 N. 16 S.
5	σ Aquarii	5	14 13 47	22 22 42.00	S. 11 26 34.3	N. 1 59	33 N. 34 S.
7	27 Piscium	5	10 28 9	23 50 58.96	4 23 20.4	N. 7 57	43 N. 28 S.
7	29 Piscium	5	12 1 48	23 54 7.59	S. 3 51 47.0	S. 7 0	28 N. 43 S.
9	ν Piscium	5	12 6 40	1 33 36.86	N. 4 43 27.5	N. 12 8	48 N. 23 S.
13	χ <sup>1</sup> Orionis	5	22 17 11	5 45 29.31	N. 20 14 27.3	S. 47 27	10 S. 70 S.
14	χ <sup>2</sup> Orionis	5	1 48 51	5 54 33.96	19 41 5.9	4 46	31 N. 23 S.
14	χ <sup>3</sup> Orionis	5	1 58 57	5 54 59.99	20 8 2.2	31 18	6 N. 51 S.
14	ν Geminor.	4	11 41 16	6 20 2.64	N. 20 17 58.1	S. 24 37	12 N. 41 S.
15	ζ Geminor.	4	1 18 10	6 55 11.99	N. 20 47 0.8	S. 2 1	16 S. 69 S.
16	δ <sup>2</sup> Cancri	6	9 35 34	8 17 19.85	17 32 6.8	N. 1 1	19 N. 19 N.
16	δ Cancri	4½	17 10 42	8 36 9.04	18 42 1.4	2 1	1 S. 1 S.
18	α Leonis	1½	4 25 42	10 0 23.01	N. 12 41 47.7	2 1	1 S. 1 S.
19	χ Leonis	4½	5 37 31	10 57 17.12	8 8 38.4	2 1	1 S. 1 S.
19	JUPITER	-	6 59 52	11 0 18.12	7 50 23.9	2 1	1 S. 1 S.
19	σ Leonis	4	12 58 6	11 13 24.12	6 50 55.2	2 1	1 S. 1 S.
20	10 Virginis	6	11 34 59	12 2 11.12	2 44 16.0	2 1	1 S. 1 S.

## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limiting Parallels.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>o</sup> <sup>'</sup> <sup>"</sup>	♄ <sup>o</sup> <sup>'</sup> <sup>"</sup>	Latitude. <sup>o</sup> <sup>'</sup> <sup>"</sup>
May 23	ξ <sup>2</sup> Libræ - -	5	19 48 16	14 48 39.98	S. 10 48 7.9	S. 11 56	20 N. 48 S.
24	γ Libræ - -	4½	14 16 23	15 27 10.36	14 17 8.2	N. 37 11	73 N. 2 N.
24	η Libræ - -	4½	18 19 51	15 35 40.60	15 11 25.6	N. 59 26	75 N. 29 N.
25	48 Libræ - -	4½	1 3 57	15 49 49.62	S. 13 50 29.5	S. 71 59	64 S. 90 S.
25	φ Ophiuchi	4½	16 34 51	16 22 35.60	S. 16 16 48.6	S. 28 27	2 S. 71 S.
25	B.A.C. 5579	5	21 27 25	16 32 56.15	17 26 44.2	N. 13 18	39 N. 22 S.
27	B.A.C. 6098	6	11 19 56	17 53 42.25	20 43 46.4	64 19	69 N. 44 N.
28	ξ <sup>1</sup> Sagittarii	6	13 2 30	18 48 27.30	S. 20 50 40.1	N. 49 5	69 N. 18 N.
28	d Sagittarii	5	22 42 0	19 8 52.85	S. 19 12 45.0	S. 40 59	25 S. 90 S.
29	f Sagittarii	5½	12 23 33	19 37 38.03	20 6 47.2	N. 38 55	70 N. 6 N.
30	π Capricorni	5	8 13 10	20 18 45.02	18 41 47.2	20 39	45 N. 14 S.
30	ρ Capricorni	5	8 58 57	20 20 19.13	S. 18 18 9.4	N. 0 15	23 N. 36 S.
30	ν Capricorni	5	14 26 47	20 31 31.41	S. 18 39 35.1	N. 46 13	71 N. 14 N.
31	29 Capricorni	5	8 8 43	21 7 27.34	15 47 19.9	S. 30 32	4 S. 75 S.
June 1	μ Capricorni	5	2 58 44	21 45 7.56	14 15 9.2	N. 3 51	33 N. 32 S.
1	42 Aquarii -	6	14 55 40	22 8 46.41	S. 13 34 26.6	N. 55 26	76 N. 24 N.
1	σ Aquarii -	5	22 0 24	22 22 42.82	S. 11 26 29.4	S. 13 50	18 N. 51 S.
3	27 Piscium -	5	18 59 26	23 50 59.70	4 23 15.3	6 36	29 N. 43 S.
3	29 Piscium -	5	20 34 57	23 54 8.32	S. 3 51 42.0	S. 21 27	14 N. 59 S.
5	ν Piscium -	5	21 35 12	1 33 37.45	N. 4 43 31.4	N. 1 54	38 N. 33 S.
6	ξ <sup>1</sup> Ceti - -	5	12 17 1	2 5 3.06	N. 8 8 20.5	S. 40 36	3 S. 82 S.
6	ξ <sup>2</sup> Ceti - -	4	19 11 52	2 20 11.03	7 47 1.3	N. 55 28	90 N. 21 N.
7	B.A.C. 845	4	2 40 46	2 36 49.93	9 28 34.6	N. 33 1	74 N. 2 S.
13	δ Cancri - -	4½	0 25 8	8 36 8.79	N. 18 42 2.1	S. 55 1	18 S. 71 S.
13	MARS - -	-	17 46 17	9 19 37.50	N. 17 0 31.3	S. 75 36	53 S. 73 S.
14	α Leonis -	1½	10 38 10	10 0 22.71	12 41 49.2	N. 36 31	79 N. 3 N.
15	χ Leonis -	4½	11 17 29	10 57 16.95	8 8 39.8	59 35	90 N. 25 N.
15	JUPITER -	-	15 37 18	11 6 58.35	N. 7 2 56.2	N. 78 18	90 N. 62 N.
15	σ Leonis -	4	18 31 4	11 13 24.39	N. 6 50 57.6	N. 58 28	90 N. 24 N.
20	ξ <sup>2</sup> Libræ - -	5	1 33 15	14 48 39.96	S. 10 48 7.0	S. 4 11	28 N. 40 S.
20	γ Libræ - -	4½	20 15 36	15 27 10.42	14 17 7.7	N. 42 54	76 N. 8 N.
21	η Libræ - -	4½	0 22 11	15 35 40.68	S. 15 11 25.3	N. 64 42	75 N. 38 N.
21	48 Libræ - -	4½	7 11 19	15 49 49.73	S. 13 50 28.8	S. 67 29	50 S. 90 S.
21	φ Ophiuchi	4½	22 52 59	16 22 35.79	16 16 48.2	S. 25 40	1 N. 67 S.
22	B.A.C. 5579	5	3 48 36	16 32 56.37	17 26 43.9	N. 15 32	42 N. 20 S.
22	29 Ophiuchi	6	13 23 24	16 53 7.22	S. 18 39 28.2	N. 38 20	70 N. 4 N.



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limiting Parallels.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			h m s	h m s	° ' "	♄	Latitude.
June 25	d Sagittarii	5	5 23 41	19 8 53.45	S. 19 12 43.5	S. 46 12	31 S. 90 S.
26	σ Capricorni	5½	11 0 3	20 10 46.00	19 34 43.1	N. 50 14	70 N. 20 N.
26	π Capricorni	5	14 52 35	20 18 45.73	18 41 44.7	N. 12 39	36 N. 23 S.
26	ρ Capricorni	5	15 38 17	20 20 19.84	S. 18 18 6.9	S. 7 48	15 N. 45 S.
26	υ Capricorni	5	21 5 44	20 31 32.14	S. 18 39 32.5	N. 37 46	70 N. 4 N.
27	29 Capricorni	5	14 47 11	21 7 28.10	15 47 16.5	S. 40 11	15 S. 90 S.
28	μ Capricorni	5	9 39 9	21 45 8.36	14 15 5.3	S. 6 53	22 N. 43 S.
28	ι Aquarii	4½	16 20 45	21 58 21.31	S. 14 35 29.7	N. 63 37	75 N. 39 N.
29	σ Aquarii	5	4 46 46	22 22 43.67	S. 11 26 24.7	S. 25 26	6 N. 66 S.
29	70 Aquarii	6	13 58 28	22 40 37.78	11 20 33.7	N. 48 5	79 N. 14 N.
July 1	27 Piscium	5	2 20 49	23 51 0.56	4 23 9.7	S. 19 3	16 N. 57 S.
1	29 Piscium	5	3 58 8	23 54 9.19	S. 3 51 36.4	S. 33 54	2 N. 78 S.
3	ν Piscium	5	6 9 13	1 33 38.26	N. 4 43 36.6	S. 9 11	27 N. 44 S.
3	ξ <sup>1</sup> Ceti	5	21 15 19	2 5 3.82	8 8 25.0	S. 50 48	14 S. 82 S.
4	ξ <sup>2</sup> Ceti	4	4 21 31	2 20 11.79	7 47 5.9	N. 45 46	90 N. 10 N.
4	B.A.C. 845	4	12 2 24	2 36 50.65	N. 9 28 38.8	N. 23 52	62 N. 10 S.
6	γ Tauri	3½	4 57 18	4 11 15.75	N. 15 15 33.5	N. 49 14	90 N. 19 N.
6	δ <sup>1</sup> Tauri	4	6 11 45	4 14 17.25	17 11 4.2	S. 56 56	21 S. 73 S.
6	δ <sup>2</sup> Tauri	4½	6 40 23	4 15 27.18	17 5 25.0	47 44	10 S. 73 S.
6	δ <sup>3</sup> Tauri	5	7 13 49	4 16 48.97	N. 17 34 45.0	S. 72 57	47 S. 72 S.
6	θ <sup>1</sup> Tauri	4½	8 31 55	4 20 0.46	N. 15 37 23.0	N. 53 56	90 N. 25 N.
6	θ <sup>2</sup> Tauri	4½	8 34 12	4 20 6.09	15 31 54.4	59 41	90 N. 32 N.
6	α Tauri	1	11 29 48	4 27 18.98	16 12 5.4	N. 40 15	88 N. 11 N.
11	VENUS	-	11 24 27	9 41 20.67	N. 15 36 56.1	S. 59 6	22 S. 74 S.
11	α Leonis	1½	19 5 56	10 0 22.54	N. 12 41 50.2	N. 44 24	90 N. 10 N.
12	MARS	-	5 17 52	10 25 6.26	11 1 0.3	43 6	90 N. 8 N.
12	χ Leonis	4½	18 56 6	10 57 16.72	8 8 41.2	68 46	90 N. 37 N.
13	σ Leonis	4	1 55 45	11 13 24.14	N. 6 50 59.2	N. 67 54	90 N. 35 N.
15	65 Virginis	6	10 4 11	13 15 33.66	S. 4 8 16.8	N. 74 0	86 N. 49 N.
17	ξ <sup>2</sup> Libræ	5	7 6 57	14 48 39.74	10 48 5.8	3 53	36 N. 32 S.
18	γ Libræ	4½	1 49 13	15 27 10.25	14 17 7.0	49 58	76 N. 16 N.
18	η Libræ	4½	5 56 23	15 35 40.53	S. 15 11 24.6	N. 71 32	75 N. 56 N.
18	48 Libræ	4½	12 46 52	15 49 49.60	S. 13 50 28.1	S. 61 4	38
19	φ Ophiuchi	4½	4 33 12	16 22 35.72	16 16 47.7	S. 20 14	
19	B.A.C. 5579	5	9 30 36	16 32 56.32	17 26 43.5	N. 20 40	
21	21 Sagittarii	6	10 40 1	18 16 27.55	S. 20 36 51.9	N. 39 44	



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ in *.	At Greenwich Mean Time of ♄			Limiting Parallels.
			Apparent R. A. of ♄ and *.	Apparent Declination of *.	Diff. of Apparent Dec. of ♄ and *.		
			h m s	h m s	° ' "	° ' "	Latitude.
July 22	d Sagittarii	5	11 30 10	19 8 53.74	S. 19 12 42.9	S. 45 41	31 S. 90 S.
23	π Capricorni	5	21 0 38	20 18 46.19	18 41 43.5	N. 11 16	34 N. 24 S.
23	ρ Capricorni	5	21 46 18	20 20 20.30	18 18 5.5	S. 9 14	13 N. 46 S.
24	ν Capricorni	5	3 13 22	20 31 32.64	S. 18 39 31.0	N. 36 3	68 N. 2 N.
24	19 Capricorni	6	10 28 5	20 46 21.46	S. 18 28 58.5	N. 60 56	72 N. 36 N.
24	21 Capricorni	6	13 27 50	20 52 27.29	18 6 27.5	N. 54 16	72 N. 25 N.
24	29 Capricorni	5	20 52 48	21 7 28.65	15 47 14.3	S. 42 47	18 S. 90 S.
25	μ Capricorni	5	15 42 16	21 45 8.97	S. 14 15 2.5	S. 10 20	18 N. 47 S.
25	ε Aquarii	4½	22 23 7	21 58 21.95	S. 14 35 26.8	N. 59 54	75 N. 32 N.
26	σ Aquarii	5	10 48 14	22 22 44.34	11 26 21.2	S. 29 37	2 N. 73 S.
28	27 Piscium	5	8 31 7	23 51 1.32	4 23 5.0	24 28	11 N. 64 S.
28	29 Piscium	5	10 9 15	23 54 9.95	S. 3 51 31.7	S. 39 20	4 S. 90 S.
30	ν Piscium	5	13 7 54	1 33 39.08	N. 4 43 41.7	S. 14 49	21 N. 51 S.
31	ξ <sup>1</sup> Ceti	5	4 36 44	2 5 4.67	8 8 30.1	S. 56 15	21 S. 82 S.
31	ξ <sup>2</sup> Ceti	4	11 54 44	2 20 12.61	7 47 10.6	N. 40 26	90 N. 5 N.
31	B.A.C. 845	4	19 49 4	2 36 51.47	N. 9 28 43.3	N. 18 43	56 N. 15 S.
Aug. 1	f Tauri	5½	16 50 5	3 22 36.87	N. 12 25 9.2	N. 41 45	90 N. 9 N.
2	γ Tauri	3½	14 2 7	4 11 16.51	15 15 36.6	N. 45 19	90 N. 16 N.
2	δ <sup>1</sup> Tauri	4	15 18 56	4 14 18.01	17 11 7.1	S. 60 49	27 S. 73 S.
2	δ <sup>2</sup> Tauri	4½	15 48 28	4 15 27.94	N. 17 5 27.9	S. 51 35	15 S. 73 S.
2	71 Tauri	5½	16 47 53	4 17 48.86	N. 15 16 17.9	N. 64 42	90 N. 40 N.
2	θ <sup>1</sup> Tauri	4½	17 43 32	4 20 1.21	15 37 25.9	50 9	90 N. 22 N.
2	θ <sup>2</sup> Tauri	4½	17 45 54	4 20 6.84	15 31 57.3	55 54	90 N. 28 N.
2	α Tauri	1	20 47 0	4 27 19.72	N. 16 12 8.2	N. 36 35	81 N. 8 N.
3	115 Tauri	5½	17 33 16	5 18 25.61	N. 17 49 37.3	N. 57 15	90 N. 34 N.
4	χ <sup>1</sup> Orionis	5	4 11 34	5 45 30.41	20 14 29.7	S. 46 38	9 S. 70 S.
4	χ <sup>2</sup> Orionis	5	7 42 44	5 54 35.00	19 41 8.3	2 58	33 N. 22 S.
4	χ <sup>3</sup> Orionis	5	7 52 47	5 55 1.03	N. 20 8 4.4	S. 29 27	8 N. 49 S.
4	ν Geminor.	4	17 29 15	6 20 3.50	N. 20 17 59.7	S. 20 4	17 N. 36 S.
5	ζ Geminor.	4	6 47 27	6 55 12.62	20 47 1.5	S. 44 17	6 S. 69 S.
9	χ Leonis	4½	4 44 9	10 57 16.59	8 8 42.0	N. 70 51	90 N. 39 N.
9	σ Leonis	4	11 32 10	11 13 23.99	N. 6 51 0.0	N. 70 7	90 N. 37 N.
10	ε Virginis	5	13 21 56	12 12 44.04	N. 4 8 53.4	S. 77 33	52 S. 86 S.
13	ξ <sup>2</sup> Libræ	5	13 52 40	14 48 39.39	S. 10 48 4.6	N. 6 15	38 N. 30 S.
14	γ Libræ	4½	8 15 45	15 27 9.90	14 17 6.0	N. 52 5	76 N. 18 N.
14	48 Libræ	4½	19 4 55	15 49 49.26	S. 13 50 27.2	S. 59 6	34 S. 90 S.



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limiting Parallels.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			h m s	h m s	° ' "	♄ ' "	Latitude.
Aug. 15	♄ Ophiuchi	4½	10 42 23	16 22 35.40	S. 16 16 47.2	S. 18 29	8 N. 57 S.
15	B.A.C. 5579	5	15 37 47	16 32 56.02	17 26 43.1	N. 22 20	49 N. 13 S.
18	♄ Sagittarii	6	7 52 48	18 48 28.02	20 50 39.4	N. 46 41	69 N. 15 N.
18	♄ Sagittarii	5	17 35 34	19 8 53.70	S. 19 12 43.1	S. 44 57	30 S. 90 S.
20	♄ Capricorni	5	3 9 3	20 18 46.31	S. 18 41 43.5	N. 11 49	35 N. 23 S.
20	♄ Capricorni	5	3 54 44	20 20 20.43	18 18 5.5	S. 8 41	14 N. 45 S.
20	♄ Capricorni	5	9 21 48	20 31 32.78	18 39 31.0	N. 36 35	69 N. 3 N.
21	29 Capricorni	5	3 0 7	21 7 28.89	S. 15 47 13.6	S. 42 16	17 S. 90 S.
21	♄ Capricorni	5	21 46 20	21 45 9.29	S. 14 15 1.4	S. 9 46	19 N. 47 S.
22	♄ Aquarii -	4½	4 25 34	21 58 22.30	14 35 25.7	N. 60 30	75 N. 33 N.
22	♄ Aquarii -	6	9 42 10	22 8 48.27	13 34 17.8	N. 40 50	72 N. 6 N.
22	♄ Aquarii -	5	16 47 10	22 22 44.73	S. 11 26 19.5	S. 28 56	2 N. 71 S.
24	27 Piscium -	5	14 15 56	23 51 1.88	S. 4 23 1.9	S. 23 16	12 N. 62 S.
24	29 Piscium -	5	15 53 41	23 54 10.52	S. 3 51 28.4	38 7	3 S. 88 S.
26	♄ Piscium -	5	18 54 2	1 33 39.79	N. 4 43 45.8	12 49	23 N. 49 S.
27	♄ Ceti - -	5	10 31 3	2 5 5.42	N. 8 8 34.2	S. 54 2	19 S. 82 S.
27	♄ Ceti - -	4	17 54 28	2 20 13.37	N. 7 47 14.7	N. 42 45	90 N. 8 N.
28	B.A.C. 845	4	1 55 51	2 36 52.28	9 28 47.5	21 7	59 N. 13 S.
29	♄ Tauri - -	3½	21 6 26	4 11 17.32	15 15 39.5	N. 48 1	90 N. 20 N.
29	♄ Tauri - -	4	22 25 29	4 14 18.83	N. 17 11 9.9	S. 58 7	24 S. 73 S.
29	♄ Tauri - -	4½	22 55 53	4 15 28.76	N. 17 5 30.7	S. 48 53	13 S. 73 S.
29	♄ Tauri - -	5	23 31 23	4 16 50.55	17 34 50.5	S. 74 5	57 S. 72 S.
30	♄ Tauri - -	4½	0 54 20	4 20 2.06	15 37 28.8	N. 52 51	90 N. 26 N.
30	♄ Tauri - -	4½	0 56 46	4 20 7.68	N. 15 32 0.2	N. 58 36	90 N. 33 N.
30	♄ Tauri - -	1	4 3 18	4 27 20.56	N. 16 12 10.9	N. 39 17	89 N. 12 N.
31	♄ Orionis	5	12 29 32	5 45 31.18	20 14 30.8	S. 44 5	7 S. 70 S.
31	♄ Orionis	5	16 7 54	5 54 35.75	19 41 9.3	0 26	35 N. 19 S.
31	♄ Orionis	5	16 18 19	5 55 1.78	N. 20 8 5.4	S. 26	10 N. 47 S.
Sept. 1	♄ Geminor.	4	2 14 25	6 20 4.24	N. 20 18		
1	♄ Geminor.	4	15 59 4	6 55 13.28	20		
3	♄ Cancri -	4½	6 58 14	8 36 9.44	N. 18		
9	♄ Libræ - -	5	22 27 12	14 48 39.00	S. 11		
10	♄ Libræ - -	4½	16 21 58	15 27 9.47	S. 1		
10	♄ Libræ - -	4½	20 19 49	15 35 39.75			
11	48 Libræ - -	4½	2 55 46	15 49 48.81			
11	♄ Ophiuchi	4½	18 13 27	16 22 34.95			

## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	At Greenwich Mean Time of ☾				Limiting Parallels.
			Greenwich Mean Time of Apparent ☾ in R. A. of ☿ and ♄.	Apparent R. A. of ☿ and ♄.	Apparent Declination of ♄.	Diff. of Apparent Dec. of ☿ and ♄.	
			h m s	h m s	° ' "	☿ ' "	Latitude. ° ' "
Sept. 11	B.A.C. 5579	5	23 3 16	16 32 55.56	S. 17 26 42.6	N. 16 31	42 N. 19 S.
12	29 Ophiuchi	6	8 28 54	16 53 6.46	18 39 27.5	N. 38 33	70 N. 4 N.
15	d Sagittarii	5	0 17 24	19 8 53.36	19 12 43.8	S. 49 57	36 S. 90 S.
16	π Capricorni	5	9 49 33	20 18 46.10	S. 18 41 44.5	N. 7 51	31 N. 28 S.
16	ρ Capricorni	5	10 35 15	20 20 20.22	S. 18 18 6.4	S. 12 38	10 N. 50 S.
16	σ Capricorni	6	11 4 19	20 21 20.05	19 4 17.0	N. 35 35	66 N. 2 N.
16	υ Capricorni	5	16 2 30	20 31 32.60	18 39 32.0	N. 32 51	63 N. 2 S.
17	29 Capricorni	5	9 41 18	21 7 28.78	S. 15 47 14.3	S. 45 14	21 S. 90 S.
18	μ Capricorni	5	4 27 1	21 45 9.27	S. 14 15 1.9	S. 11 46	17 N. 49 S.
18	ι Aquarii - 4½		11 5 39	21 58 22.32	14 35 26.2	N. 58 52	75 N. 30 N.
18	σ Aquarii - 5		23 25 19	22 22 44.81	11 26 19.5	S. 29 50	2 N. 73 S.
19	70 Aquarii - 6		8 31 57	22 40 39.03	S. 11 20 28.2	N. 44 1	79 N. 9 N.
20	27 Piscium - 5		20 37 3	23 51 2.16	S. 4 23 0.6	S. 21 6	15 N. 59 S.
20	29 Piscium - 5		22 13 56	23 54 10.80	S. 3 51 27.1	35 50	0 82 S.
23	ν Piscium - 5		0 43 6	1 33 40.32	N. 4 43 48.4	6 54	29 N. 42 S.
23	ξ Ceti - 5		16 11 40	2 5 5.99	N. 8 8 37.0	S. 47 8	11 S. 82 S.
23	ξ Ceti - 4		23 31 48	2 20 13.97	N. 7 47 17.3	N. 50 5	90 N. 16 N.
24	B.A.C. 845	4	7 30 17	2 36 52.91	9 28 50.1	28 54	69 N. 5 S.
26	γ Tauri - 3½		2 42 18	4 11 18.12	15 15 41.7	N. 57 29	90 N. 31 N.
26	δ Tauri - 4		4 1 57	4 14 19.64	N. 17 11 12.1	S. 48 36	13 S. 73 S.
26	δ Tauri - 4½		4 32 35	4 15 29.57	N. 17 5 32.9	S. 39 22	2 S. 71 S.
26	δ Tauri - 5		5 8 22	4 16 51.36	17 34 52.8	S. 64 33	34 S. 72 S.
26	θ Tauri - 4½		6 32 0	4 20 2.83	15 37 30.8	N. 62 25	90 N. 38 N.
26	θ Tauri - 4½		6 34 27	4 20 8.46	N. 15 32 2.2	N. 68 10	90 N. 48 N.
26	α Tauri - 1		9 42 41	4 27 21.33	N. 16 12 12.8	N. 48 55	90 N. 22 N.
27	χ Orionis - 5		18 39 7	5 45 32.01	20 14 31.5	S. 34 14	3 N. 57 S.
27	χ Orionis - 5		22 22 15	5 54 36.57	19 41 9.9	N. 9 23	46 N. 10 S.
27	χ Orionis - 5		22 32 53	5 55 2.60	N. 20 8 5.9	S. 17 6	19 N. 36 S.
28	ν Geminor. 4		8 43 20	6 20 5.06	N. 20 18 0.3	S. 7 58	28 N. 24 S.
28	ζ Geminor. 4		22 50 36	6 55 14.07	20 47 0.8	S. 32 43	4 N. 51 S.
29	γ Geminor. 6		15 40 8	7 37 27.18	18 52 9.1	N. 52 33	90 N. 31 N.
30	δ Cancri - 4½		15 5 0	8 36 10.07	N. 18 41 58.9	S. 40 43	3 S. 69 S.
Oct. 1	ψ Leonis - 6		15 6 43	9 35 33.95	N. 14 42 10.8	N. 23 25	61 N. 7 S.
2	α Leonis - 1½		1 19 25	10 0 23.21	12 41 47.2	50 41	90 N. 17 N.
3	χ Leonis - 4½		1 12 22	10 57 16.94	8 8 39.6	72 12	90 N. 42 N.
3	σ Leonis - 4		8 6 2	11 13 24.25	N. 6 50 58.0	N. 70 23	90 N. 38 N.



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	At Greenwich Mean Time of $\delta$				Limiting Parallels.
			Greenwich Mean Time of Apparent $\delta$ in R. A. of C and *.	Apparent R. A. of C and *.	Apparent Declination of *.	Diff. of Apparent Dec. of C and *.	
			h m s	h m s	° ' "	° ' "	Latitude.
Oct. 7	$\xi^2$ Libræ - 5		8 14 1	14 48 38.72	S. 10 48 3.0	S. 7 40	25 N. 44 S.
8	$\gamma$ Libræ - 4½		1 48 20	15 27 9.12	14 17 4.3	N. 36 32	71 N. 1 S.
8	$\eta$ Libræ - 4½		5 41 17	15 35 39.38	15 11 22.0	N. 57 44	75 N. 24 N.
9	$\phi$ Ophiuchi - 4½		3 7 1	16 22 34.51	S. 16 16 46.0	S. 35 41	9 S. 83 S.
9	B.A.C. 5579	5	7 50 40	16 32 55.11	S. 17 26 42.1	N. 4 55	30 N. 31 S.
11	$\mu^1$ Sagittarii - 4		2 2 6	18 4 48.88	21 5 27.8	59 21	69 N. 32 N.
11	$\xi^2$ Sagittarii - 4		22 29 2	18 48 48.15	21 17 47.3	56 0	69 N. 28 N.
12	$\pi$ Sagittarii - 4½		4 8 15	19 0 51.92	S. 21 15 17.2	N. 56 24	69 N. 28 N.
12	$d$ Sagittarii - 5		7 54 26	19 8 52.87	S. 19 12 44.6	S. 62 30	54 S. 90 S.
13	$\pi$ Capricorni - 5		17 16 25	20 18 45.68	18 41 45.8	3 55	19 N. 40 S.
13	$\rho$ Capricorni - 5		18 2 3	20 20 19.80	18 18 7.8	S. 24 22	2 S. 66 S.
13	$\nu$ Capricorni - 5		23 28 55	20 31 32.20	S. 18 39 33.5	N. 21 19	47 N. 14 S.
14	19 Capricorni - 6		6 43 36	20 46 21.11	S. 18 29 1.0	N. 46 48	72 N. 14 N.
14	21 Capricorni - 6		9 43 21	20 52 26.97	18 6 29.9	N. 40 24	72 N. 6 N.
14	29 Capricorni - 5		17 8 19	21 7 28.44	15 47 15.8	S. 55 57	34 S. 90 S.
14	$\epsilon$ Capricorni - 5		20 20 14	21 13 55.39	S. 17 27 59.2	N. 64 33	73 N. 42 N.
15	$\mu$ Capricorni - 5		11 56 41	21 45 8.99	S. 14 15 3.4	S. 21 22	8 N. 61 S.
15	$\epsilon$ Aquarii - 4½		18 36 27	21 58 22.07	14 35 27.8	N. 49 44	75 N. 17 N.
16	$\sigma$ Aquarii - 5		6 58 15	22 22 44.61	11 26 20.8	S. 38 0	7 S. 90 S.
18	27 Piscium - 5		4 10 54	23 51 2.17	S. 4 23 1.1	S. 24 47	11 N. 64 S.
18	29 Piscium - 5		5 47 29	23 54 10.82	S. 3 51 27.5	S. 39 20	3 S. 90 S.
20	$\nu$ Piscium - 5		7 51 11	1 33 40.58	N. 4 43 49.1	4 12	32 N. 40 S.
20	$\xi^1$ Ceti - 5		23 6 8	2 5 6.34	8 8 38.1	S. 42 29	5 S. 79 S.
21	$\xi^2$ Ceti - 4		6 19 6	2 20 14.38	N. 7 47 18.4	N. 55 37	90 N. 22 N.
21	B.A.C. 845	4	14 9 24	2 36 53.34	N. 9 28 51.3	N. 35 22	80 N. 1 N.
22	$f^1$ Tauri - 5½		11 8 40	3 22 38.94	12 25 16.7	61 58	90 N. 33 N.
23	$\gamma$ Tauri - 3½		8 35 43	4 11 18.76	15 15 42.7	N. 68 25	90 N. 22 N.
23	$\delta^1$ Tauri - 4		9 54 5	4 14 20.29	N. 17 11 13.3	S. 37 34	0
23	$\delta^2$ Tauri - 4½		10 24 13	4 15 30.23	N. 17 5 34.0	S. 28 17	
23	$\delta^3$ Tauri - 5		10 59 26	4 16 52.02	17 34 53.9	S. 53 2.5	
23	75 Tauri - 6		12 18 9	4 19 55.10	16 1 13.3	N. 49 3	
23	$\theta^1$ Tauri - 4½		12 21 45	4 20 3.49	N. 15 37 31.7	N. 73 4	
23	$\alpha$ Tauri - 1		15 29 30	4 27 22.01	N. 16 15 7	N. 60 0	
24	119 Tauri - 5½		15 0 18	5 23 28.03		N. 52	
25	$\chi^1$ Orionis - 5		0 3 27	5 45 32.84		S. 20	
25	$\chi^2$ Orionis - 5		3 45 13	5 54 37.41		23	

## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limit Parall.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			h m s	h m s	° ' "	° ' "	Latitud.
Oct. 25	χ <sup>4</sup> Orionis -	5	3 55 48	5 55 3'44	N.20 8 5'7	S. 3 16	33 N.
25	ν Geminor.	4	14 4 0	6 20 5'88	20 17 59'6	N. 6 16	43 N.
26	ζ Geminor.	4	4 12 3	6 55 14'95	20 46 59'5	S. 18 7	19 N.
27	δ Cancri -	4½	20 54 44	8 36 10'86	N.18 41 55'7	S.26 16	11 N.
29	α Leonis -	1½	7 59 52	10 0 23'87	N.12 41 43'5	N.63 17	90 N.
31	ε Virginis -	5	18 18 25	12 12 44'37	N. 4 8 48'6	S.75 27	47 S.
Nov. 5	φ Ophiuchi	4½	12 25 35	16 22 34'32	S.16 16 46'0	45 45	19 S.
5	B.A.C. 5579	5	17 6 13	16 32 54'89	S.17 26 42'0	S. 5 37	20 N.
7	B.A.C. 6098	6	5 39 42	17 53 41'30	S.20 43 46'7	N.34 29	60 N.
7	μ <sup>1</sup> Sagittarii	4	10 43 19	18 4 48'50	21 5 27'8	45 21	69 N.
8	33 Sagittarii	6	5 9 37	18 45 3'33	21 32 6'5	55 0	68 N.
8	ξ <sup>3</sup> Sagittarii	4	6 53 9	18 48 47'72	S.21 17 47'6	N.40 52	69 N.
8	π Sagittarii	4½	12 28 4	19 0 51'48	S.21 15 17'6	N.41 2	69 N.
10	π Capricorni	5	1 16 16	20 18 45'22	18 41 47'1	S.20 17	2 N.
10	ρ Capricorni	5	2 1 40	20 20 19'34	18 18 9'0	S.40 45	19 S.
10	υ Capricorni	5	7 27 9	20 31 31'74	S.18 39 34'9	N. 4 54	29 N.
11	ε Capricorni	5	4 16 57	21 13 54'95	S.17 28 1'0	N.48 13	73 N.
11	μ Capricorni	5	19 56 8	21 45 8'60	14 15 5'2	S.37 22	9 S.
12	ι Aquarii -	4½	2 37 56	21 58 21'67	14 35 29'8	N.33 57	70 N.
12	45 Aquarii -	6	9 4 3	22 10 59'55	S.14 2 57'2	N.52 58	76 N.
12	σ Aquarii -	5	15 4 43	22 22 44'26	S.11 26 22'8	S.53 16	24 S.
14	27 Piscium -	5	12 42 13	23 51 1'98	4 23 2'8	36 38	0
14	29 Piscium -	5	14 19 39	23 54 10'64	S. 3 51 29'1	51 1	16 S.
16	ν Piscium -	5	16 37 32	1 33 40'63	N. 4 43 48'4	S. 9 36	27 N.
17	ξ <sup>1</sup> Ceti -	5	7 49 20	2 5 6'48	N. 8 8 37'9	S.45 38	8 S.
17	ξ <sup>2</sup> Ceti -	4	14 59 17	2 20 14'54	7 47 18'0	N.53 34	90 N.
17	B.A.C. 845-	4	22 45 10	2 36 53'55	9 28 51'1	34 31	78 N.
19	γ Tauri -	3½	16 28 13	4 11 19'22	N.15 15 42'8	N.73 51	90 N.
19	δ <sup>1</sup> Tauri -	4	17 44 48	4 14 20'77	N.17 11 13'6	S.31 57	6 N.
19	δ <sup>2</sup> Tauri -	4½	18 14 15	4 15 30'71	17 5 34'3	22 36	15 N.
19	δ <sup>3</sup> Tauri -	5	18 48 39	4 16 52'51	17 34 54'3	S.47 39	10 S.
19	α Tauri -	1	23 12 21	4 27 22'52	N.16 12 13'7	N.66 48	90 N.
21	χ <sup>1</sup> Orionis -	5	6 55 30	5 45 33'53	N.20 14 31'0	S.10 10	27 N.
21	χ <sup>2</sup> Orionis -	5	10 31 17	5 54 38'11	19 41 8'9	N.34 2	78 N.
21	χ <sup>3</sup> Orionis -	5	10 41 35	5 55 4'15	20 8 5'0	7 34	44 N.
21	68 Orionis -	6	13 54 11	6 3 11'82	N.19 48 56'6	N.34 50	79 N.



## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ☾ in R. A. of ☾ and *.	At Greenwich Mean Time of ☾			Limiting Parallels.
				Apparent R. A. of ☾ and *.	Apparent Declination of *.	Diff. of Apparent Dec. of ☾ and *.	
			<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	Latitude.
Nov. 21	ν Geminor.	4	20 33 33	6 20 6.64	N. 20 17 58.6	N. 18 9	56 N. 0
22	ζ Geminor.	4	10 20 2	6 55 15.75	20 46 57.9	S. 4 56	32 N. 20 S.
23	α <sup>1</sup> Cancri -	6	17 41 34	8 14 48.91	18 48 23.8	N. 28 45	69 N. 4 N.
24	δ Cancri -	4½	2 16 26	8 36 11.78	N. 18 41 52.1	S. 10 30	27 N. 34 S.
27	ν Virginis -	4½	8 24 47	11 38 10.37	N. 7 21 58.6	S. 65 47	30 S. 83 S.
27	δ Virginis -	5½	14 52 37	11 52 17.28	4 29 15.2	N. 30 25	70 N. 8 S.
28	c Virginis -	5	0 19 34	12 12 45.06	N. 4 8 43.5	S. 62 29	26 S. 86 S.
Dec. 1	ξ <sup>2</sup> Libræ -	5	1 28 32	14 48 39.10	S. 10 48 6.2	S. 8 58	24 N. 46 S.
5	ξ <sup>2</sup> Sagittarii	4	15 10 12	18 48 47.55	S. 21 17 47.8	N. 30 41	51 N. 5 S.
5	π Sagittarii	4½	20 42 40	19 0 51.29	21 15 17.9	N. 30 20	51 N. 5 S.
7	π Capricorni	5	9 14 23	20 18 44.92	18 41 48.0	S. 33 41	11 S. 83 S.
7	ρ Capricorni	5	9 59 30	20 20 19.04	S. 18 18 10.0	S. 54 11	36 S. 90 S.
7	v Capricorni	5	15 23 5	20 31 31.43	S. 18 39 35.8	S. 8 52	15 N. 46 S.
8	ι Capricorni	5	12 8 17	21 13 54.61	17 28 2.3	N. 33 27	66 N. 2 S.
9	μ Capricorni	5	3 47 34	21 45 8.24	14 15 6.9	S. 52 39	27 S. 90 S.
9	ι Aquarii -	4½	10 30 32	21 58 21.32	S. 14 35 31.5	N. 18 31	50 N. 18 S.
9	σ Aquarii -	5	23 1 17	22 22 43.91	S. 11 26 24.7	S. 68 52	53 S. 90 S.
10	ψ <sup>2</sup> Aquarii -	5	23 43 27	23 10 8.47	9 59 52.0	N. 69 14	80 N. 47 N.
11	27 Piscium -	5	21 12 45	23 51 1.69	4 23 4.8	S. 51 29	17 S. 90 S.
11	29 Piscium -	5	22 51 52	23 54 10.35	S. 3 51 31.1	S. 65 48	38 S. 90 S.
14	ν Piscium -	5	2 6 3	1 33 40.48	N. 4 43 46.9	S. 20 45	17 N. 58 S.
14	ξ <sup>1</sup> Ceti -	5	17 32 37	2 5 6.39	8 8 36.8	S. 55 11	19 S. 82 S.
15	ξ <sup>2</sup> Ceti -	4	0 48 27	2 20 14.49	7 47 16.8	N. 44 51	90 N. 9 N.
15	B.A.C. 845	4	8 39 45	2 36 53.54	N. 9 28 50.1	N. 26 44	66 N. 9 S.
16	f <sup>2</sup> Tauri -	5½	5 29 54	3 22 39.37	N. 12 25 15.9	N. 59 9	90 N. 28 N.
17	γ Tauri -	3½	2 29 17	4 11 19.45	15 15 42.2	N. 71 32	90 N. 50 N.
17	δ <sup>1</sup> Tauri -	4	3 45 23	4 14 21.01	17 11 13.4	S. 34 6	4 N. 64 S.
17	δ <sup>2</sup> Tauri -	4½	4 14 38	4 15 30.95	N. 17 5 34.1	S. 24 41	13 N. 52 S.
17	δ <sup>3</sup> Tauri -	5	4 48 49	4 16 52.75	N. 17 34 54.2	S. 49 39	12 S. 72 S.
17	75 Tauri -	6	6 5 7	4 19 55.84	16 1 13.0	N. 53 40	90 N. 25 N.
17	B.A.C. 1391	5½	6 57 45	4 22 2.48	15 51 48.9	69 37	90 N. 47 N.
17	α Tauri -	1	9 10 23	4 27 22.79	N. 16 12 13.3	N. 65 24	90 N. 41 N.
18	119 Tauri -	5½	7 45 47	5 23 29.10	N. 18 28 36.1	N. 63 41	90 N. 42 N.
18	χ <sup>1</sup> Orionis -	5	16 23 27	5 45 34.00	20 14 30.5	S. 7 24	30 N. 27 S.
18	χ <sup>2</sup> Orionis -	6	16 36 37	5 46 7.92	19 42 50.1	N. 25 2	64 N. 3 N.
18	χ <sup>3</sup> Orionis -	5	19 54 18	5 54 38.61	N. 19 41 8.3	N. 37 15	83 N. 15 N.

## ELEMENTS

for facilitating the Computation of Occultations of certain Stars by the Moon.

Day of the Month.	Star's Name.	Magnitude.	Greenwich Mean Time of Apparent ♄ in R. A. of ♄ and ♀.	At Greenwich Mean Time of ♄			Limiting Parallels.
				Apparent R. A. of ♄ and ♀.	Apparent Declination of ♀.	Diff. of Apparent Dec. of ♄ and ♀.	
			h m s	h m s	° ' "	♄	Latitude.
Dec. 18	χ <sup>4</sup> Orionis -	5	20 4 21	5 55 4'65	N. 20 8 4'5	N. 10 49	47° N. 9° S.
19	ν Geminor.	4	5 41 23	6 20 7'22	20 17 57'7	22 36	61° N. 3° N.
19	ζ Geminor.	4	19 4 1	6 55 16'40	20 46 56'7	N. 1 8	38° N. 14° S.
21	δ Cancri -	4½	9 40 20	8 36 12'59	N. 18 41 49'2	S. 0 29	36° N. 24° S.
22	ψ Leonis -	6	9 16 54	9 35 36'40	N. 14 41 58'3	N. 61 52	90° N. 36° N.
24	ν Virginis -	4½	13 47 56	11 38 11'24	7 21 52'9	S. 52 33	13° S. 83° S.
25	ε Virginis -	5	5 34 33	12 12 45'92	N. 4 8 37'8	S. 49 31	10° S. 86° S.
26	80 Virginis -	6	16 47 25	13 27 45'17	S. 4 38 0'2	N. 52 22	85° N. 14° N.
28	ξ <sup>2</sup> Libræ -	5	7 19 36	14 48 39'79	S. 10 48 10'1	S. 0 48	32° N. 37° S.
29	γ Libræ -	4½	1 31 57	15 27 9'96	14 17 9'2	N. 36 43	73° N. 0
29	η Libræ -	4½	5 31 48	15 35 40'16	15 11 26'4	N. 56 29	75° N. 23° N.
30	φ Ophiuchi	4½	3 24 56	16 22 34'99	S. 16 16 49'2	S. 44 30	18° S. 90° S.
31	B. A. C. 5579	5	8 12 10	16 32 55'52	S. 17 26 44'6	S. 5 28	20° N. 42° S.
31	VENUS -	-	23 58 17	17 7 10'00	S. 18 22 46'1	S. 36 6	11° S. 89° S.



## ECLIPSES OF THE SUN.

In the Year 1850, there will be only two Eclipses, both of the Sun.

I. — *An Annular Eclipse of the SUN, Feb. 11, 1850, invisible at Greenwich.*

Begins on the Earth generally Feb. 11<sup>d</sup> 15<sup>h</sup> 25<sup>m</sup>·9, Mean Time at Greenwich,  
in Longitude 39° 22' E. of Greenwich, and Latitude 11° 21' S.

Central Eclipse begins generally Feb. 11<sup>d</sup> 16<sup>h</sup> 32<sup>m</sup>·8,

in Longitude 22° 53' E. of Greenwich, and Latitude 10° 21' S.

Central Eclipse at Noon Feb. 11<sup>d</sup> 18<sup>h</sup> 30<sup>m</sup>·9,

in Longitude 85° 54' E. of Greenwich, and Latitude 10° 58' S.

Central Eclipse ends generally Feb. 11<sup>d</sup> 20<sup>h</sup> 26<sup>m</sup>·4,

in Longitude 143° 6' E. of Greenwich, and Latitude 15° 49' N.

Ends on the Earth generally Feb. 11<sup>d</sup> 21<sup>h</sup> 33<sup>m</sup>·3,

in Longitude 126° 37' E. of Greenwich, and Latitude 14° 50' N.

The Central line passes over the points on the Earth's surface, whose positions are,

Longitude	22° 53'	} E. of Greenwich.	Latitude	10° 21' S.
	38 8			13 47
	49 22			15 37
	61 23			16 25
	73 56			15 9
	85 54			10 58
	96 21			5 0 S.
	107 7			1 34 N.
	117 36			7 1
	128 0			11 17
	143 6			15 49 N.

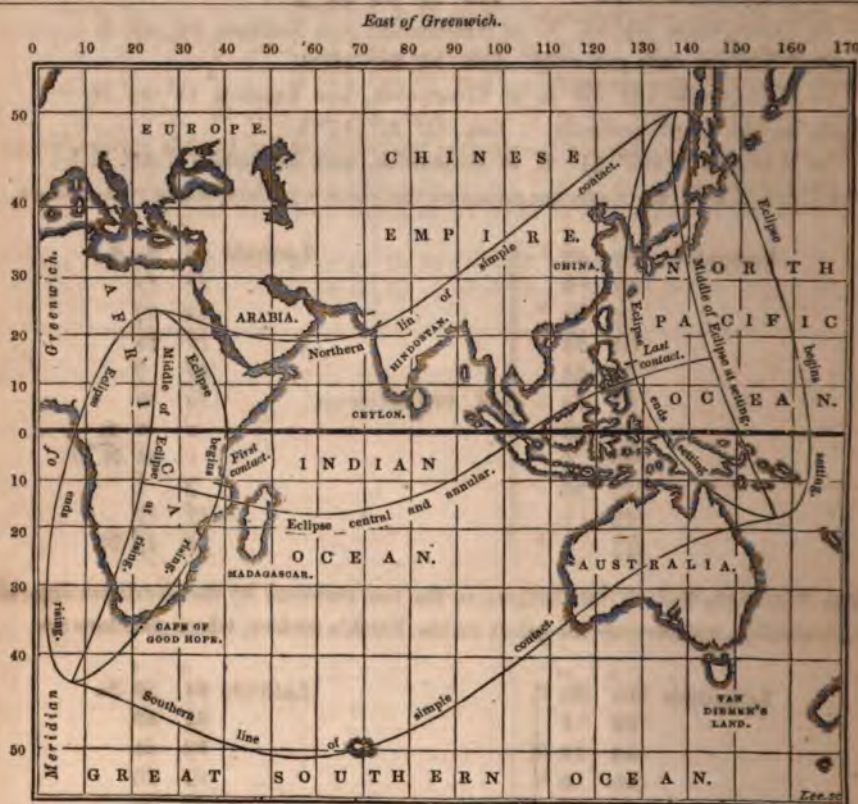
The Northern limit of this Eclipse, or the line traversed by the Northern edge of the Penumbra, passes over the points on the Earth's surface, whose positions are,

Longitude	25° 29'	} E. of Greenwich.	Latitude	24° 30' N.
	38 5			21 32
	49 12			19 41
	60 8			19 12
	71 3			20 59
	83 37			26 32
	94 52			32 59
	106 52			39 17
	120 6			44 52
	136 28			50 3 N.

The Southern limit of this Eclipse, or the line traversed by the Southern edge of the Penumbra, passes over the points on the Earth's surface, whose positions are,

Longitude	<sup>0</sup> 7 43	} E. of Greenwich.	Latitude	<sup>0</sup> 43 36 S.
	27 17			47 47
	45 58			50 9
	65 39			50 21
	85 31			47 18
	104 50			39 59
	118 4			32 53
	129 44			26 51
	141 35			21 58
	155 50			17 49 S.

PATH OF THE MOON'S PENUMBRA UPON THE SURFACE OF THE EARTH,  
DURING THE ANNULAR ECLIPSE OF THE SUN, FEBRUARY 11, 1850.



At the CAPE OF GOOD HOPE the Sun will rise at 18<sup>h</sup> 37<sup>m</sup> partially eclipsed.

Begins	- - - - - Feb. 11 <sup>d</sup> 17 13 <sup>m</sup> 3 <sup>s</sup>	} Mean Time at the Cape.
Greatest Phase	- - - - - 17 59 0	
Ends	- - - - - 18 48 3	

Magnitude of the Eclipse (Sun's diameter = 1) 0.292 on the Northern limb.



Angle from North Pole of { first contact  $53^{\circ}$ , towards the West.  
last contact  $38^{\circ}$ , towards the East.

Angle from Vertex of { first contact  $73^{\circ}$ , towards the East.  
last contact  $160^{\circ}$ , towards the East.

II.—*A Total Eclipse of the SUN, Aug. 7, 1850, invisible at Greenwich.*

Begins on the Earth generally Aug. 7<sup>d</sup> 6<sup>h</sup> 56<sup>m</sup>.0, Mean Time at Greenwich,  
in Longitude  $163^{\circ} 52'$  E. of Greenwich, and Latitude  $11^{\circ} 49'$  N.

Central Eclipse begins generally Aug. 7<sup>d</sup> 7<sup>h</sup> 50<sup>m</sup>.6,  
in Longitude  $150^{\circ} 5'$  E. of Greenwich, and Latitude  $12^{\circ} 17'$  N.

Central Eclipse at Noon Aug. 7<sup>d</sup> 9<sup>h</sup> 32<sup>m</sup>.8,  
in Longitude  $141^{\circ} 50'$  W. of Greenwich, and Latitude  $17^{\circ} 50'$  N.

Central Eclipse ends generally Aug. 7<sup>d</sup> 11<sup>h</sup> 15<sup>m</sup>.9,  
in Longitude  $80^{\circ} 28'$  W. of Greenwich, and Latitude  $9^{\circ} 42'$  S.

Ends on the Earth generally Aug. 7<sup>d</sup> 12<sup>h</sup> 10<sup>m</sup>.5,  
in Longitude  $94^{\circ} 16'$  W. of Greenwich, and Latitude  $10^{\circ} 9'$  S.

The centre of the Shadow passes over the points on the Earth's surface, whose positions are,

Longitude	$^{\circ}$	$'$		Latitude	$^{\circ}$	$'$	
150		5	E.]	12		17	N.
164		20		16		17	
176		52	E.]	19		10	
170		19	W.]	20		59	
156		58		21		2	
141		50	} of Greenwich.	17		50	
127		38		11		30	
116		24		5		26	N.
105		29		0		8	S.
94		11		5		1	
80		28	W.]	9		42	S.

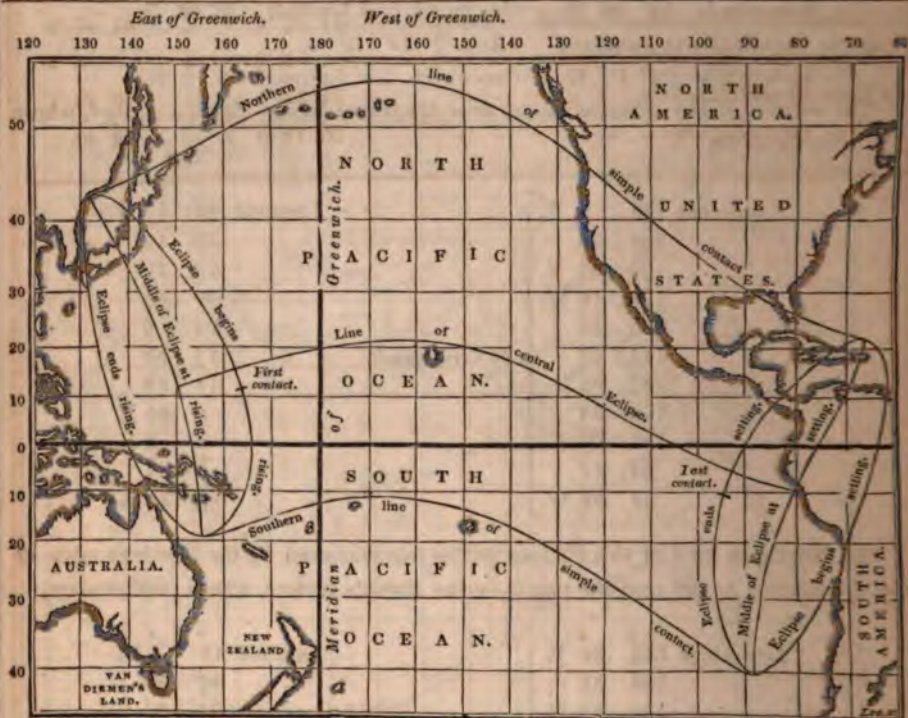
The Northern limit of this Eclipse, or the line traversed by the Northern edge of the Penumbra, passes over the points on the Earth's surface, whose positions are,

Longitude	$^{\circ}$	$'$		Latitude	$^{\circ}$	$'$	
133		30	E.]	43		8	N.
150		35		47			
169		55	E.]	51			
168		25	W.]				
145		12	} of Greenwich.				
121		17					
105		44					
92		32					
79		40					
66		36	W.]				

The Southern limit of this Eclipse, or the line traversed by the Southern edge of the Penumbra, passes over the points on the Earth's surface, whose positions are,

Longitude	155° 46' E.	} of Greenwich.	Latitude	18° 38' S.
	170 22 E.			14 27
	177 28 W.			11 45
	165 49			10 31
	154 10			11 33
	141 27			15 55
	130 1			21 47
	118 15			28 1
	105 12			34 2
	88 17 W.			40 13 S.

PATH OF THE MOON'S SHADOW AND PENUMBRA UPON THE SURFACE OF THE EARTH, DURING THE TOTAL ECLIPSE OF THE SUN, AUGUST 7, 1850.





## ELEMENTS OF THE ECLIPSES OF THE SUN.

1850.	February 11.	August 7.
Greenwich Mean Time of $\odot$ in R. A. - -	<sup>h</sup> 18 <sup>m</sup> 30 <sup>s</sup> 55.5	<sup>h</sup> 9 <sup>m</sup> 32 <sup>s</sup> 44.8
$\odot$ and $\sphericalangle$ 's Right Ascension - - - -	21 42 20.80	9 9 37.65
$\sphericalangle$ 's Declination - - - - -	S. 13 <sup>°</sup> 43 <sup>'</sup> 59.3	N. 16 <sup>°</sup> 23 <sup>'</sup> 24.4
$\odot$ 's Declination - - - - -	S. 13 46 43.6	N. 16 21 57.8
$\sphericalangle$ 's Horary Motion in R. A. - - - -	30 24.3	38 51.5
$\odot$ 's Horary Motion in R. A. - - - -	2 27.5	2 23.4
$\sphericalangle$ 's Horary Motion in Declination - - -	N. 7 17.8	S. 7 41.9
$\odot$ 's Horary Motion in Declination - - -	N. 0 49.8	S. 0 42.2
$\sphericalangle$ 's Equatorial Horizontal Parallax - -	51 37.2	61 17.4
$\odot$ 's Equatorial Horizontal Parallax - -	8.7	8.5
$\sphericalangle$ 's True Semidiameter - - - - -	14 53.1	16 42.1
$\odot$ 's True Semidiameter - - - - -	16 12.9	15 47.9

## MEAN TIME.

## JANUARY.

d	h	m		°	'
2	6	13	♂ ♂ †	- - -	♂ 25 24 S.
3	4	25	♂ ♂ ☾	- - -	♂ 1 16 S.
3	19	9	♂	greatest Hel. Lat. S.	
6	16	38	♀	in ☿	
7	22	0	♂	Stationary.	
9	21	51	☿	♂ ☉ intens. of light 0.693	
11	21	20	♀ ♂ ☾	- - -	♀ 3 50 S.
12	9	58	♂ ☐ ☉		
13	20	51	†	☐ ☉	
14	12	15	♂ ♂ ☾	- - -	♂ 2 45 S.
14	18	48	♂ ♂ ☾	- - -	♂ 5 14 N.
18	17	8	♂ ♂ ☾	- - -	♂ 1 3 N.
20	3	27	♂ ♂ ☾	- - -	♂ 4 9 N.
21	9	0	†	☐ ☉	
22	13	29	♂	greatest elong. 18 32 E.	
22	18	46	♀	in ☿	
23	11	5	♂	Stationary.	
24	4	5	♂ ♂ ☾	- - -	♂ 8 6 N.
26	16	48	♀ ♂ †	- - -	† 23 10 N.
27	8	21	♀	in Perihelion.	
28	13	48	♀	Stationary.	
30	12	44	♂ ♂ ☾	- - -	♂ 1 11 S.

## FEBRUARY.

d	h	m		°	'
4	17	48	♂ ♂ ☾	- - -	♂ 10 38 N.
6	16	19	♂	greatest Hel. Lat. N.	
7	1	4	♀	in Inf. ♂ ☉	
7	6	41	♀ ♂ ☉		
8	19	5	♀ ♂ ♀	- - -	♀ 5 5 N.
9	21	23	♀	in Aphelion.	
10	22	34	♂ ♂ ☾	- - -	♂ 2 46 N.
11	-	-	☉	eclipsed, invis. at Greenh.	
11	9	29	♀ ♂ ☾	- - -	♀ 1 45 S.
15	3	16	♂ ♂ ☾	- - -	♂ 1 22 N.
16	5	49	♀ ♂ ☾	- - -	♀ 5 57 S.
16	10	22	♂ ♂ ☾	- - -	♂ 4 14 N.
18	0	0	†	Stationary.	
19	1	8	♀	Stationary.	
20	19	50	♂ ♂ ☾	- - -	♂ 7 29 N.

## FEBRUARY.

d	h	m		°	'
26	19	5	♂ ♂ ☾	- - -	♂ 0 51 S.
28	0	0	†	in Aphelion.	
28	0	0	☐	Stationary.	

## MARCH.

d	h	m		°	'
2	4	12	♂	in ☿	
2	13	17	♀	in Sup. ♂ ☉	
3	0	0	♂ ♂ 132 Tauri	* 1 30	
4	13	16	♀	greatest Hel. Lat. S.	
4	23	9	♂	greatest elong. 27 19	
5	14	16	♂ ♂ 136 Tauri	* 1 34	
7	18	55	♂ ♂ γ Capricorni	* 1 44	
8	13	10	♂	♂ ☉	
9	6	46	♂ ♂ δ Capricorni	* 1 33	
11	4	35	♂ ♂ ☾	- - -	♂ 1 20
12	8	0	♀	in Aphelion.	
13	15	42	♀ ♂ ☾	- - -	♀ 1 29
14	15	25	♂ ♂ ☾	- - -	♂ 1 35
15	18	32	♂ ♂ ☾	- - -	♂ 4 14
19	19	42	♂ ♂ σ Leonis	* 0 13	
20	10	51	♂ ♂ ☾	- - -	♂ 5 45
20	11	3	☉	enters ♍. Spring comm.	
20	20	0	♂ ♂ ☾	- - -	♂ 6 23
21	17	6	♂ ♂ λ Aquarii	* 1 59	
24	0	0	♀	in Aphelion.	
24	14	22	♂ ☐ ☉		
25	7	52	♀ ♂ ♀	- - -	♀ 1 5
25	23	11	♂ ♂ ☾	- - -	♂ 0 32
31	10	17	† ♂ ζ Virginis	* 0 8	
31	10	32	♂ ♂ ☉		

## APRIL.

d	h	m		°	'
1	18	23	♂	greatest Hel. Lat. S.	
1	18	58	♂ ♂ ε Geminor	* 0 8	
6	9	10	☐ ☐ ☉		
6	12	0	♀ ♂ ♀	- - -	♀ 0 22
8	0	7	† ♂ ☉	intens. of light 0.4	



## MEAN TIME.

## APRIL.

d	h	m		o	i
9	12	0	♂ greatest Hel. Lat. N.		
10	1	9	♀ ♂ ♄ - - -	♀ 0 39 N.	
11	5	31	♄ ♂ ♄ - - -	♄ 1 47 N.	
11	9	56	♀ ♂ ♄ - - -	♀ 2 45 N.	
12	4	48	♄ ♂ ♄ - - -	♄ 4 15 N.	
12	17	41	♀ ♂ ♄ - - -	♀ 4 21 N.	
16	4	0	♄ ♂ ☉		
16	21	20	♀ ♂ ♄ - - -	♀ 0 8 S.	
17	4	0	♄ ♂ ♄ Geminor. *	1 29 N.	
17	12	13	♀ in Sup. ♂ ☉		
18	0	44	♄ ♂ ♄ - - -	♄ 4 55 N.	
20	18	1	♀ in ♈		
22	2	17	♄ ♂ ♄ - - -	♄ 0 31 S.	
24	0	0	♄ ♂ ♄ Geminor. *	0 43 S.	
25	7	37	♀ in Perihelion.		
29	20	8	♀ in ♈		
29	13	25	♄ ♂ ♄ Geminor. *	1 15 N.	
30	12	0	♄ ♂ ♄ Geminor. *	1 59 N.	

## MAY.

d	h	m		o	i
2	3	20	♀ ♂ ♄ - - -	♀ 1 49 N.	
5	15	35	♄ greatest Hel. Lat. N.		
8	12	0	♄ ♂ ♄ - - -	♄ 2 11 N.	
8	20	30	♄ ♂ ♄ - - -	♄ 2 2 N.	
9	0	0	♄ ♂ ♄ Piscium *	0 49 N.	
9	16	38	♄ ♂ ♄ - - -	♄ 4 22 N.	
10	4	20	♄ Stationary.		
12	18	6	♀ ♂ ♄ - - -	♀ 5 17 N.	
13	0	16	♀ ♂ ♄ - - -	♀ 7 4 N.	
13	18	28	♄ in Aphelion.		
15	22	25	♀ greatest elong. 22 0 E.		
16	8	13	♄ ♂ ♄ - - -	♄ 3 11 N.	
19	7	0	♄ ♂ ♄ - - -	♄ 0 49 S.	
22	3	17	♀ ♂ ♄ - - -	♀ 0 38 N.	
25	7	15	♄ ♂ ♄ γ Cancri *	1 42 N.	
25	23	19	♄ ♂ ♄ δ Cancri *	1 30 S.	
28	15	46	♄ ☉		
28	18	46	♀ Stationary.		
29	3	28	♀ in ♉		

## JUNE.

d	h	m		o	i
1	18	22	♄ ♂ γ Cancri *	0 32 S.	
2	7	0	♀ in Perihelion.		
4	0	0	♄ Stationary.		
4	11	12	♀ ♂ ♄ Geminor. *	0 42 N.	
4	16	17	♄ ☉		
5	10	46	♄ ♂ ♄ - - -	♄ 2 17 N.	
6	4	35	♄ ♂ ♄ - - -	♄ 4 33 N.	
8	7	17	♀ in Aphelion.		
9	18	28	♀ in Inf. ♂ ☉		
9	19	7	♀ ♂ ♄ - - -	♀ 1 6 N.	
11	8	3	♀ ♂ ♄ Geminor. *	1 44 S.	
11	16	32	♀ ♂ ♄ - - -	♀ 4 3 N.	
13	17	46	♄ ♂ ♄ - - -	♄ 1 16 N.	
15	15	37	♄ ♂ ♄ - - -	♄ 1 18 S.	
15	23	6	♀ ♂ ♄ Geminor. *	1 28 N.	
21	8	0	☉ enters ♋. Summer comm.		
21	15	10	♀ Stationary.		
22	0	0	♄ Stationary.		
24	7	51	♀ greatest Hel. Lat. N.		
26	17	23	♄ ☉		
27	14	26	♀ ♂ γ Cancri *	1 29 N.	
27	21	55	♀ ♂ δ Cancri *	1 44 S.	
28	17	39	♀ greatest Hel. Lat. S.		
30	11	13	♄ ♂ σ Leonis *	0 31 N.	

## JULY.

d	h	m		o	i
1	10	36	♄ ♂ α Leonis *	0 44 S.	
2	22	39	♄ ♂ ♄ - - -	♄ 2 26 N.	
3	9	49	☉ in Apogee.		
3	15	7	♄ ♂ ♄ - - -	♄ 4 45 N.	
3	17	53	♀ greatest elong.		
5	2	24	♄ ☉		
5	18	35	♀ ♂ ζ Tauri		
7	15	9	♀ ♂ ♄ - - -		
11	11	25	♀ ♂ ♄ - - -		
12	3	30	♄ ♂ ρ L		
12	5	18	♄ ♂ ♄ - - -		
12	7	0	♀ ♂ η ♄		
12	12	0	♀ ♂ ♄ - - -		

## MEAN TIME.

## JULY.

d	h	m		°	'
12	23	22	♂ ☐ ☉		
13	4	55	♂ ☐ - - -	♂	1 50 S.
13	6	10	♂ ☐ ♀ Leonis	*	1 53 S.
13	11	6	♂ ☐ μ Geminor.	*	0 4 N.
15	14	43	♀ ☐ α Leonis	*	1 11 S.
17	17	17	♀ in ☐		
19	18	41	☐ ☐ η Leonis	*	0 35 N.
21	1	32	♀ ☐ ρ Leonis	*	1 23 S.
22	6	51	♀ in Perihelion.		
23	2	13	☐ ☐ ☉		
26	6	51	♂ ☐ χ Leonis	*	0 29 N.
28	10	56	♀ ☐ χ Leonis	*	0 11 N.
30	7	0	♂ ☐ - - -	♂	2 26 N.
30	22	26	♀ ☐ - - -	♀	0 15 S.
30	23	5	☐ ☐ - - -	☐	4 50 N.
31	0	28	♀ in Sup. ☐ ☉		

## AUGUST.

d	h	m		°	'
1	0	0	♀ greatest Hel. Lat. S.		
1	5	10	♀ ☐ σ Leonis	*	0 44 N.
1	14	51	♂ greatest Hel. Lat. N.		
2	7	39	♂ ☐ σ Leonis	*	0 57 N.
2	19	41	♀ ☐ τ Leonis	*	1 38 S.
3	8	55	♂ Stationary.		
5	6	58	♂ ☐ τ Leonis	*	1 28 S.
5	9	28	☐ Stationary.		
6	11	43	♀ ☐ - - -	♀	0 24 S.
7	-	-	☉ eclipsed, invis. at Green <sup>b</sup> .		
8	0	9	♂ ☐ - - -	♂	0 51 N.
8	4	41	♀ ☐ β Virginis	*	0 1 N.
8	5	20	♂ ☐ ζ Virginis	*	0 3 N.
9	0	0	♀ Stationary.		
9	18	54	♂ ☐ - - -	♂	2 35 S.
9	22	10	♂ ☐ - - -	♂	2 19 S.
10	3	48	♀ ☐ - - -	♀	3 13 S.
14	10	43	♂ ☐ - - -	♂	0 27 S.
15	2	36	♂ ☐ β Virginis	*	0 1 S.
15	7	0	♀ ☐ η Virginis	*	1 13 N.
16	12	33	♂ ☐ β Virginis	*	0 28 S.

## AUGUST.

d	h	m		°	'
17	15	5	♂ ☐ - - -	♂	3 52
19	9	29	♀ in ☐		
22	11	55	♂ ☐ τ Leonis	*	0 58
22	19	11	♂ ☐ ☉ intens. of light 0.3		
25	2	43	♀ in ☐		
26	11	54	♂ ☐ - - -	♂	2 15
26	16	51	♂ ☐ β Virginis	*	0 59
27	4	36	☐ ☐ - - -	☐	4 47
28	10	36	♂ ☐ - - -	♂	1 43
31	2	51	♀ ☐ α Virginis	*	1 19

## SEPTEMBER.

d	h	m		°	'
4	6	31	♀ in Aphelion.		
6	17	42	♂ ☐ - - -	♂	2 44
7	10	37	♂ ☐ - - -	♂	6 39
7	10	46	♂ ☐ - - -	♂	4 6
7	15	17	♂ ☐ - - -	♂	2 35
8	20	54	♀ ☐ - - -	♀	6 58
10	19	46	♀ ☐ - - -	♀	10 40
12	10	48	♀ greatest elong. 26 36		
16	19	38	♂ ☐ α Virginis	*	1 19
17	20	42	☐ ☐ ☉		
20	4	17	♂ ☐ α Virginis	*	1 31
22	13	2	♀ in Aphelion.		
22	14	55	♂ ☐ - - -	♂	2 1
22	22	0	☉ enters ♄. Autumn com		
23	8	59	☐ ☐ - - -	☐	4 40
24	16	52	♂ greatest Hel. Lat. S.		
24	21	5	♀ ☐ ☉ intens. of light 0.7		
25	16	25	♀ Stationary.		
25	20	38	♂ ☐ - - -	♂	4 20
26	10	52	♂ ☐ ☉		

## OCTOBER.

d	h	m		°	'
4	13	34	♂ ☐ - - -	♂	3 6
5	0	0	☐ ☐ - - -	☐	4 6
5	8	25	♂ ☐ - - -	♂	7 46



## MEAN TIME.

## OCTOBER.

d	h	m		°	'
5	16	9	♀♂ A Scorpii *	1	26 S.
5	21	36	♀ greatest elong.	46	40 E.
6	5	4	♂♂ - - -	♂ 5	3 S.
6	22	3	♀♂ π Scorpii *	1	53 S.
7	7	58	♀♂ ♄ Scorpii *	1	42 N.
8	3	16	♀ in Inf. ♂☉		
8	15	23	♀♂♂ - - -	♀ 8	44 S.
10	0	0	♂ Stationary.		
10	16	53	♂♂☉		
12	9	8	♀♂ σ Scorpii *	0	4 S.
13	1	53	♀♂♂ - - -	♀ 5	35 S.
13	16	32	♀ in ♄		
14	9	42	♀♂ α Scorpii *	0	30 S.
15	6	7	♀ greatest Hel. Lat. S.		
16	0	0	♀♂ τ Scorpii *	1	59 S.
16	11	55	♀ Stationary.		
18	6	7	♀ in Perihelion.		
19	18	17	♂♂♂ - - -	♂ 1	51 N.
20	11	3	♂♂♂ - - -	♂ 4	35 N.
21	14	32	♂♂☉		
23	15	8	♀ greatest elong.	18	20 W.
24	2	3	♂ in ♄		
26	11	20	♀♂ A Ophiuchi *	1	4 N.
27	3	12	♀♂♂ - - -	♀ 3	9 S.
28	14	8	♀ greatest Hel. Lat. N.		

## NOVEMBER.

d	h	m		°	'
1	7	52	♀♂♂ - - -	♀ 3	27 S.
2	8	20	♀♂♂ - - -	♀ 3	6 S.
4	2	1	♂♂♂ - - -	♂ 5	16 S.
5	8	0	♂♂♂ - - -	♂ 9	4 N.
5	12	26	♀♂ 3 Sagittarii *	0	12 N.
7	0	28	♀♂♂ - - -	♀ 8	3 S.
8	14	25	♂♂ β Aquarii *	1	7 S.
10	1	51	♂♂ e Piscium *	1	21 N.
10	5	16	♀ at greatest brilliancy.		
12	3	36	♂♂☉		
12	15	13	♀♂ γ <sup>1</sup> Sagittarii *	1	45 S.

## NOVEMBER.

d	h	m		°	'
14	6	30	♀♂ B.A.C. 6127 *	0	41 S.
14	12	55	♂☉		
15	23	37	♂♂♂ - - -	♂ 2	1 N.
16	20	51	♂♂♂ - - -	♂ 4	39 N.
17	0	0	♂ greatest Hel. Lat. N.		
19	0	0	♂ Stationary.		
21	2	0	♀ in ♄		
21	4	48	♀♂♂ - - -	♀ 9	6 S.
25	13	42	♀ Stationary.		
27	22	51	♀ in Sup. ♂☉		
28	11	2	♀♂♂ - - -	♀ 0	27 S.
28	23	19	♀♂♂ - - -	♀ 3	47 S.
29	4	2	♂♂☉		
29	10	6	♀♂ θ Virginis *	0	37 N.
30	15	10	♂♂ α Virginis *	1	58 N.

## DECEMBER.

d	h	m		°	'
1	5	45	♀ in Aphelion.		
3	1	33	♂♂♂ - - -	♂ 4	45 S.
3	10	10	♀♂♂ - - -	♀ 5	23 S.
4	17	46	♀♂♂ - - -	♀ 4	26 S.
6	0	0	♀ greatest Hel. Lat. N.		
10	12	49	♀ in ♄		
11	0	0	♂ in Aphelion.		
11	12	49	♀♂♀ - - -	♀ 2	9 S.
13	7	7	♂♂♂ - - -	♂ 2	19 N.
14	5	0	♂♂♂ - - -	♂ 4	50 N.
16	4	2	♀ in Inf. ♂☉		
17	22	32	♂ Stationary.		
19	21	20	♀♂♂ - - -	♂ 2	57 S.
21	15	38	☉ enters ♋. Winter comm*.		
21	16	8	♀ greatest Hel. Lat. S.		
21	20	12	♂☉		
21	20	13	♂♂ ξ <sup>1</sup> Libræ *	0	28 S.
26	11	46	♀♂♂ - - -	♀ 4	1 S.
29	12	0	♂♂ θ Aquarii *	1	18 S.
30	23	58	♀♂♂ - - -	♀ 0	36 N.
31	6	21	☉ in Perigee.		

ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION,  
MAGNITUDE, AND APPEARANCE OF SATURN'S RING.

Mean Noon.	$p$	$a$	$b$	$a'$	$b'$	$l$	$l'$
Jan. 1	+3° 52' 0"	39' 30"	-3' 15"	26' 13"	-2' 10"	-4° 36' 1"	-7° 15' 3"
Feb. 10	3 34' 3"	37' 06"	3' 96"	24' 65"	2' 64"	6 8' 4"	7 51' 0"
Mar. 22	3 8	36' 05"	5' 18"	23' 98"	3' 45"	8 16' 0"	8 26' 3"
May 1	2 10	36' 40"	6' 55"	21' 02"	4' 37"	10 23' 3"	9- 1' 9"
June 10	2 9 -			2	5' 26"	12 0' 1"	9 37' 2"
July 20	1			8	5' 97"	12 44' 0"	10 12' 3"
Aug. 29	1			2	6' 20"	12 23' 4"	10 47' 1"
Oct. 8	2 14' 0"			3	5' 81"	11 13' 3"	11 21' 7"
Nov. 17	2 32' 4"	43' 78"		1	5' 11"	10 5' 9"	11 56' 0"
Dec. 27	2			1	4' 72"	9 57' 2"	12 30' 1"
— 31				1	-4' 71"	-10 0' 5"	-12 33' 5"

$p$  denotes the inclination of the Northern semi-minor axes of the Rings to the circle of Declination; + East, — West.

$a$  the apparent outer *major* axis of the outer Ring.

$b$  ——— outer *minor* axis of the outer Ring; + North surface visible,  
— South surface visible.

$a'$  ——— inner *major* axis of the inner Ring.

$b'$  ——— inner *minor* axis of the inner Ring.

$l$  the elevation of the Earth above the plane of the Ring, as seen from Saturn; + North, — South.

$l'$  the elevation of the Sun above the plane of the Ring, as seen from Saturn;  
+ North, — South.



TABLE,

SHOWING THE MEAN TIME OF THE GREATEST LIBRATION OF THE MOON'S APPARENT DISC.

	d	h	m	
Jan.	4	4	43	N.W.
	20	8	22	N.E.
Feb.	1	12	52	N.W.
	17	0	28	N.E.
Mar.	1	17	54	N.W.
	15	10	6	N.E.
	29	13	33	N.W.
Apr.	11	0	22	N.E.
	25	15	19	N.W.
May	8	12	20	N.E.
	21	21	45	N.W.
June	5	11	15	N.E.
	17	22	55	N.W.
July	3	15	8	N.E.
	15	20	5	N.W.
	31	19	39	N.E.
Aug.	13	0	3	N.W.
	28	19	1	N.E.
Sept.	10	4	41	N.W.
	24	23	35	N.E.
Oct.	8	5	19	N.W.
	21	4	5	N.E.
Nov.	4	19	22	N.W.
	17	4	27	N.E.
Dec.	1	10	20	N.W.
	15	0	21	N.E.
	27	17	54	N.W.

The Moon's Libration is here supposed to take place in the plane of her Orbit—and by the time of the greatest Libration of her Apparent Disc is to be understood the instant at which, to an observer at the centre of the Earth, the variation of the Disc from its mean state has attained its maximum.

The right-hand column indicates the quadrant of the Moon's Disc in which the Libration takes place, and in which the greatest change of the Moon's surface will become visible.

TABLE,

SHOWING THE ILLUMINATED PORTION OF THE DISCS OF VENUS AND MARS.

1850.	VENUS.	MARS.
Jan. 15	0.982	0.965
Feb. 14	0.998	0.917
Mar. 15	0.999	0.900
Apr. 15	0.982	0.902
May 15	0.946	0.916
June 15	0.886	0.935
July 15	0.807	0.953
Aug. 15	0.708	0.971
Sept. 15	0.589	0.985
Oct. 15	0.441	0.994
Nov. 15	0.218	0.999
Dec. 15	0.000	0.999

The numbers given in this Table represent the versed sines of the illuminated portion of the Discs, the apparent Diameters of the Planets being considered as *unity*.

## MEAN TIME OF HIGH WATER AT LONDON BRIDGE,

Reckoning from Noon of each Day.

Day of the Month.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.	
	h	m	h	m	h	m	h	m	h	m	h	m
1	4	11	16	35	5	26	17	47	4	21	16	40
2	4	59	17	22	6	7	18	28	4	58	17	16
3	5	49	18	14	6	51	19	14	5	35	17	56
4	6	36	19	1	7	36	20	4	6	14	18	33
5	7	27	19	55	8	35	21	12	6	55	19	16
6	8	26	21	0	9	48	22	25	7	43	20	12
7	9	34	22	8	11	5	23	42	8	52	21	32
8	10	43	23	18	—	12	17	—	10	15	22	55
9	11	50	—	—	0	44	13	6	11	33	—	—
10	0	20	12	45	1	28	13	50	0	10	12	38
11	1	8	13	29	2	9	14	27	1	1	13	22
12	1	51	14	10	2	43	15	2	1	42	14	0
13	2	26	14	45	3	17	15	33	2	20	14	35
14	3	2	15	19	3	48	16	4	2	52	15	9
15	3	37	15	51	4	20	16	37	3	24	15	41
16	4	8	16	24	4	53	17	11	3	56	16	14
17	4	41	16	56	5	28	17	48	4	31	16	49
18	5	15	17	34	6	7	18	27	5	5	17	25
19	5	51	18	12	6	49	19	14	5	45	18	6
20	6	32	18	55	7	41	20	15	6	28	18	52
21	7	18	19	46	8	53	21	36	7	22	19	56
22	8	17	20	50	10	17	23	1	7	13	19	50
23	9	29	22	4	11	44	—	—	8	31	21	14
24	10	44	23	25	0	20	12	51	9	41	22	15
25	11	59	—	—	1	20	13	46	10	50	23	24
26	0	29	12	59	2	10	14	33	11	54	—	—
27	1	28	13	54	2	57	15	18	0	20	12	44
28	2	20	14	47	3	40	16	0	1	7	13	29
29	3	13	15	36	—	—	—	—	2	52	15	11
30	3	58	16	21	—	—	—	—	3	30	15	46
31	4	42	17	4	—	—	—	—	4	3	16	20

If the time of High Water be required, according to the *civil* mode of reckoning:

1. *For the Morning Tide*:—With the day of the month *preceding* the given date take the time opposite thereto from the 2nd column of the month, and diminish it by 12 hours.

2. *For the Afternoon Tide*:—With the given date, take the time opposite thereto from the 1st column of the month.



## MEAN TIME OF HIGH WATER AT LONDON BRIDGE,

Reckoning from Noon of each Day.

Day of the Month.	JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
	h	m	h	m	h	m	h	m	h	m	h	m
1	6	27	18	49	7	25	19	53	9	4	21	45
2	7	12	19	39	8	22	20	59	10	26	23	9
3	8	7	20	39	9	35	22	11	11	47	—	—
4	9	15	21	45	10	47	23	27	0	19	12	51
5	10	16	22	49	11	59	—	—	1	19	13	43
6	11	20	23	52	0	33	13	2	2	7	14	32
7	—	12	20	—	1	30	13	57	3	13	15	33
8	0	47	13	13	2	21	14	46	3	52	16	9
9	1	40	14	6	3	11	15	35	4	29	16	48
10	2	31	14	59	3	57	16	20	5	5	17	25
11	3	24	15	48	4	43	17	3	5	45	18	6
12	4	11	16	35	5	25	17	49	6	29	18	52
13	5	1	17	26	6	10	18	32	7	21	19	55
14	5	51	18	16	6	56	19	20	8	36	21	20
15	6	40	19	6	7	46	20	14	9	21	22	2
16	7	32	20	1	8	51	21	28	10	44	23	22
17	8	30	21	5	10	4	22	41	11	58	—	—
18	9	37	22	8	11	20	23	56	0	25	12	48
19	10	42	23	16	—	12	24	—	1	14	13	30
20	11	51	—	—	0	50	13	14	1	47	14	3
21	0	19	12	46	1	35	13	55	2	20	14	36
22	1	9	13	33	2	12	14	29	2	50	15	5
23	1	54	14	14	2	47	15	3	3	22	15	38
24	2	31	14	51	3	18	15	35	3	54	16	10
25	3	8	15	26	3	49	16	4	4	26	16	43
26	3	40	15	56	4	20	16	37	5	3	17	22
27	4	13	16	29	4	53	17	10	5	41	18	2
28	4	45	17	3	5	28	17	46	6	26	18	53
29	5	21	17	38	6	6	18	27	7	25	20	2
30	5	57	18	16	6	50	19	17	8	46	21	31
31	6	38	19	2	7	47	20	20	—	—	—	—

*Example:—*Required the Mean Time of High Water, at London Bridge, for the Morning and Afternoon of Jan. 19, 1850.

1. Opposite the day *preceding*, viz. 18, and in the 2nd column, under JANUARY, is 17<sup>h</sup> 34<sup>m</sup>, which, being diminished by 12<sup>h</sup>, gives 5<sup>h</sup> 34<sup>m</sup> for the Time of High Water in the Morning.

2. Opposite the given date, and in the 1st column, under JANUARY, is 5<sup>h</sup> 51<sup>m</sup>, which is the Time of High Water in the Afternoon.



TIME OF HIGH WATER, ON THE FULL AND CHANGE OF THE MOON  
AT THE UNDERMENTIONED PORTS AND PLACES.

PLACE.	SITUATION.	Time of High Water.	PLACE.	SITUATION.	Time of High Water.
		h m			h m
Aberdeen Bar-	Scotland-	1 11	Chausey Islands -	France -	6
Aberdovy - -	Wales - -	7 30	Cherbourg - -	France - -	7
Aberystwith -	Wales - -	7 30	Chichester Harbour	England -	11
Achill Head -	Ireland - -	6 0	Christchurch Harbour	England -	8
Agnes (St.) -	Scilly Isles -	4 30	Clear Cape - -	Ireland - -	4
Air Point - -	Isle of Man -	11 7	Coquet Island -	England -	2
Aldborough -	England -	10 45	Cordonan - -	France - -	3
Alderney Pier	English Channel	6 45	Cork Harbour -	Ireland -	4
Amlwch Port	Anglesea -	10 30	Cornwall Cape -	England -	4
Antwerp - -	Netherlands-	4 25	Cowes - - -	Isle of Wight	10
Arran Isle - -	Scotland -	11 15	Cromartie - -	Scotland -	11
Arundel Bar -	England -	11 15	Cuckolds Point -	River Thames	2
Ballyshannon Bar	Ireland - -	5 30	Cuxhaven - -	Germany -	1
Balta - - -	Shetland -	9 45	Dartmouth Harbour	England -	6
Baltimore - -	Ireland - -	3 45	Deal - - -	England -	11
Banff - - -	Scotland -	0 41	Dee (River) - -	Scotland -	0
Bantry Bay -	Ireland - -	3 46	Dielette Harbour-	France - -	6
Bardsey Island	Wales - -	8 0	Dieppe - - -	France -	11
Barmouth - -	Wales - -	7 55	Dingle Bay - -	Ireland -	3
Barnstaple Bar	England -	5 30	Donaghadee Pier	Ireland -	9
Beachy Head -	England -	11 50	Donegal Bar -	Ireland -	5
Beaumaris - -	Wales - -	10 26	Douglas's Harbour	Isle of Man	11
Belfast - - -	Ireland -	10 5	Dover Pier - -	England -	11
Berwick - - -	England -	2 18	Downing's Bay }	Ireland -	5
Blakeney Harbour	England -	6 50	Sheephaven }		
Blythe - - -	England -	2 45	Downs (Stream) -	England -	2
Bolt Head - -	England -	5 45	Dublin Bar - -	Ireland -	11
Bordeaux - -	France - -	6 52	Dunbar - - -	Scotland -	2
Boston - - -	England -	7 15	Duncansby Head	Scotland -	8
Boulogne - -	France - -	11 26	Dundalk Bar -	Ireland -	11
Brehat Island -	France - -	5 52	Dundee - - -	Scotland -	2
Brest Harbour	France - -	3 46	Dungarvon - -	Ireland -	4
Bridgewater -	England -	6 45	Dungeness - -	England -	10
Bridlington -	England -	4 30	Dunkerque - -	France -	0
Bridport - -	England -	6 0	Eddystone - -	English Chan.	5
Brielle - - -	Netherlands-	3 0	Exmouth Bar -	England -	6
Brighton - -	England -	11 38	Eyemouth - -	Scotland -	2
Bristol - - -	England -	7 15	Falmouth - - -	England -	5
Brouwershaven	Netherlands-	2 0	Fécamp - - -	France -	10
Burnt Island -	Scotland -	2 30	Flamboro' Head -	England -	4
Caermarthen Bar	Wales - -	6 10	Flatholm - - -	England -	6
Calais - - -	France - -	11 48	Flushing - - -	Netherlands	1
Caldy Island -	Coast of Wales	6 0	Fowey - - -	England -	5
Calf of Man -	St. Geo. Channel	11 5	Galloway (Mull)	Scotland -	11
Cancale Bay -	France - -	6 9	Galway Bay - -	Ireland -	4
Cantire (Mull)	Scotland -	9 0	Glenan Islands -	France -	3
Cardigan Bar -	Wales - -	7 0	Goeree (West Gat.)	Holland -	1
Carlingford Bar	Ireland -	10 40	Granville - - -	France -	6
Carnarvon Bar	Wales - -	9 20	Gravelines - -	France -	11
Chatham - -	England -	0 54	Gravesend - -	England -	1



TIME OF HIGH WATER, ON THE FULL AND CHANGE OF THE MOON,  
AT THE UNDERMENTIONED PORTS AND PLACES.

PLACE.	SITUATION.	Time of High Water.	PLACE.	SITUATION.	Time of High Water.
		h m			h m
Penock - -	W. C. of Scotland	11 45	Peterhead - - -	Scotland - -	0 45
ernsey Pier -	English Channel	6 30	Plymouth Dock Yard	England - -	5 33
fleet - -	River Thames	12 0	Portland Race (Stream)	England - -	9 15
rtlepool - -	England - -	3 45	Portland Road - -	England - -	6 15
rwich - -	England - -	11 30	Port Patrick - -	Scotland - -	11 0
stings - -	England - -	10 36	Portsmouth Dock Yd.	England - -	11 40
vre de Grace	France - -	9 52	Ramsgate Harbour	England - -	11 20
ligoland - -	German Ocean	11 45	Rathlin L., Church Bay	N. C. of Irel.	9 0
llevoetsluis -	Holland - -	2 0	Rye Harbour - -	England - -	10 40
llesley Bay -	England - -	11 30	Salcombe - - -	England - -	5 50
lyhead Bay -	Wales - -	10 0	Saltees - - -	Ireland - -	5 40
ly Island Harb.	England - -	2 30	Scalloway - - -	Shetland - -	9 45
nfleur Harbour	France - -	9 30	Scarborough - -	England - -	4 25
orn Point -	Jutland - -	13 44	Scilly Islands - -	England - -	4 32
owth Harbour	Ireland - -	11 8	Selsea Harbour -	England - -	11 15
all - -	England - -	6 0	Shannon Mouth -	Ireland - -	3 50
amber River Ent.	England - -	5 30	Sheerness Dock Yard	England - -	0 39
swich - -	England - -	12 0	Shields - - -	England - -	3 0
e de Bas - -	France - -	4 50	Shoreham Harbour	England - -	11 15
ersey (St. Aubin's)	English Channel	6 10	Skerries - - -	Ireland - -	4 45
enmare River	Ireland - -	3 30	Sligo Bay, Ballisadare	Ireland - -	5 59
ing's Road -	Bristol Channel	6 45	Solebay - - -	England - -	10 30
ingstown Harb.	Ireland - -	11 12	Southampton - -	England - -	11 40
insale Harbour	Ireland - -	4 30	Spithead (Stream)-	England - -	9 30
irkeudbright -	Scotland - -	11 15	Spurn Point - -	England - -	5 20
a Hougue Harb.	France - -	8 45	St. Helen's Harbour	England - -	11 0
and's End -	England - -	4 30	St. Ives - - -	England - -	4 30
ieith Pier - -	Scotland - -	2 22	St. Malo - - -	France - -	6 5
erwick Harbour	Shetland - -	10 30	Stromness - - -	Orkneys - -	9 0
ewis Islands -	Scotland - -	6 0	Sunderland - -	England - -	3 0
iverpool Dock	England - -	11 22	Swansea Bay - -	Wales - -	5 56
ondon Bridge -	River Thames	2 7	Tay Bar - - -	Scotland - -	2 5
argate Pier -	England - -	0 5	Tees River Bar -	England - -	3 30
ilford Haven Ent.	Wales - -	5 45	Terschelling, West	Holland - -	8 40
inehead Pier -	England - -	6 30	Texel, Helder Road }	Holland - -	9 0
ontrose - -	Scotland - -	1 43	E. Stream - - }		
orlaix - -	N. C. of France	5 15	Torbay - - -	England - -	6 5
eedles Point -	Isle of Wight	9 45	Tralee Bay - - -	Ireland - -	3 45
ewcastle - -	England - -	4 0	Tynemouth Bar -	England - -	2 50
ewhaven - -	England - -	11 50	Waterford Harbour	Ireland - -	5 50
ewport - -	Wales - -	6 45	Wexford Harbour -	Ireland - -	7 30
ieuport - -	France - -	11 45	Weymouth - - -	England - -	6 30
ore Light (Stream)	River Thames	1 9	Whitby - - -	England - -	3 45
rfordness - -	England - -	10 40	Wick - - -	Scotland - -	7
stend - - -	Flanders - -	0 55	Wicklow - - -	Ireland - -	
embroke Dock Yd.	Wales - -	6 4	Wisbeach - - -	England - -	
entland Frith -	Scotland - -	10 30	Wranger Oog - -	E. Fri	
enzance - -	England - -	4 30	Yarmouth Roads -	Eng	
			Youghall - - -	I-	



TABLE, SHOWING THE CORRECTION REQUIRED ON ACCOUNT OF SECOND DIFFERENCES,

In finding the Greenwich Time corresponding to a reduced Lunar Distance.

*Arguments:—*Approximate Interval and Difference of Proportional Logarithms

Approximate Interval.				Difference of the Proportional Logarithms in the Ephemeris.																											
h		m		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48				
0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
0	10	2	50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3				
0	20	2	40	0	1	1	1	1	2	2	2	2	2	3	3	3	4	4	4	4	4	5	5	5	5	6	6				
0	30	2	30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8				
0	40	2	20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10				
0	50	2	10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12				
1	0	2	0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13				
1	10	1	50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14				
1	20	1	40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15				
1	30	1	30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15				
				Difference of the Proportional Logarithms in the Ephemeris.																											
h		m		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100				
0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
0	10	2	50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6				
0	20	2	40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12				
0	30	2	30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17				
0	40	2	20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	21				
0	50	2	10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	24				
1	0	2	0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	27				
1	10	1	50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	29				
1	20	1	40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	30	30	30				
1	30	1	30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31				
				Difference of the Proportional Logarithms in the Ephemeris.																											
h		m		104	106	108	110	112	114	116	118	120	122	124	126	128	130														
0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0														
0	10	2	50	7	7	7	7	7	7	8	8	8	8	8	8	8	9														
0	20	2	40	13	13	13	14	14	14	14	15	15	15	15	15	16	16														
0	30	2	30	18	18	19	19	19	20	20	20	21	21	21	22	22	23														
0	40	2	20	22	23	23	24	24	25	25	25	26	26	27	27	28	28														
0	50	2	10	26	26	27	27	28	29	29	29	30	30	31	31	32	33														
1	0	2	0	29	29	30	30	31	31	32	33	33	34	34	35	35	36														
1	10	1	50	31	31	32	32	33	34	34	35	35	36	37	37	38	39														
1	20	1	40	32	33	33	34	34	35	35	36	37	38	38	39	39	40														
1	30	1	30	32	33	34	34	35	35	36	36	37	38	39	39	40	41														

The Correction is to be added to the approximate Greenwich Time when the Proportional Logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.



TABLES FOR DETERMINING THE LATITUDE BY OBSERVATIONS  
OF THE POLE STAR OUT OF THE MERIDIAN.

TABLE I.

Containing the *First* Correction.*Argument*:—Sidereal Time of Observation.

Sidereal Time.	Correction.	Sidereal Time.	Sidereal Time.	Correction.	Sidereal Time.
<sup>h</sup> <sup>m</sup>	<sup>s</sup> <sup>'</sup> <sup>"</sup> <sup>+</sup>	<sup>h</sup> <sup>m</sup>	<sup>h</sup> <sup>m</sup>	<sup>s</sup> <sup>'</sup> <sup>"</sup> <sup>+</sup>	<sup>h</sup> <sup>m</sup>
0 0	— 1 25 13 +	12 0	6 0	— 0 25 6 +	18 0
10	1 26 14	10	10	0 21 22	10
20	1 27 5	20	20	0 17 35	20
30	1 27 46	30	30	0 13 46	30
40	1 28 17	40	40	0 9 56	40
50	1 28 38	50	50	0 6 4	50
1 0	1 28 48	13 0	7 0	— 0 2 12 +	19 0
10	1 28 49	10	10	+ 0 1 41 —	10
20	1 28 40	20	20	0 5 33	20
30	1 28 20	30	30	0 9 25	30
40	1 27 50	40	40	0 13 16	40
50	1 27 11	50	50	0 17 5	50
2 0	1 26 21	14 0	8 0	0 20 52	20 0
10	1 25 21	10	10	0 24 37	10
20	1 24 12	20	20	0 28 19	20
30	1 22 53	30	30	0 31 57	30
40	1 21 25	40	40	0 35 32	40
50	1 19 47	50	50	0 39 3	50
3 0	1 18 0	15 0	9 0	0 42 30	21 0
10	1 16 5	10	10	0 45 52	10
20	1 14 1	20	20	0 49 8	20
30	1 11 48	30	30	0 52 19	30
40	1 9 27	40	40	0 55 24	40
50	1 6 58	50	50	0 58 23	50
4 0	1 4 21	16 0	10 0	1 1 15	22 0
10	1 1 37	10	10	1 3 59	10
20	0 58 46	20	20	1 6 37	20
30	0 55 48	30	30	1 9 7	30
40	0 52 44	40	40	1 11 29	40
50	0 49 34	50	50		50
5 0	0 46 18	17 0	11 0		23 0
10	0 42 57	10	10		10
20	0 39 31	20	20		20
30	0 36 1	30	30		30
40	0 32 26	40	40		40
50	0 28 48	50	50		50
6 0	— 0 25 6 +	18 0	0		24 0

TABLE II.

Containing the *Second* Correction. (*always to be added.*)*Arguments*:—Sidereal Time and Altitude.

Sidereal		Altitude.										Sidereal	
Time.		0°	5°	10°	15°	20°	25°	30°	35°	Time.			
h	m	'	"	'	"	'	"	'	"	'	"	h	m
0	0	0 0	0 0	0 1	0 1	0 2	0 3	0 3	0 4	12	0		
	30	0 0	0 0	0 0	0 0	0 1	0 1	0 1	0 1				30
1	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	13	0		
	30	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1				30
2	0	0 0	0 0	0 1	0 1	0 1	0 2	0 2	0 3	14	0		
	30	0 0	0 1	0 2	0 2	0 3	0 4	0 5	0 6				30
3	0	0 0	0 1	0 3	0 4	0 6	0 7	0 9	0 11	15	0		
	30	0 0	0 2	0 4	0 6	0 9	0 11	0 14	0 17				30
4	0	0 0	0 3	0 6	0 9	0 12	0 15	0 19	0 23	16	0		
	30	0 0	0 4	0 7	0 11	0 15	0 19	0 24	0 29				30
5	0	0 0	0 4	0 9	0 13	0 18	0 23	0 29	0 35	17	0		
	30	0 0	0 5	0 10	0 15	0 21	0 27	0 33	0 40				30
6	0	0 0	0 6	0 11	0 17	0 23	0 30	0 37	0 44	18	0		
	30	0 0	0 6	0 12	0 18	0 24	0 31	0 39	0 47				30
7	0	0 0	0 6	0 12	0 18	0 25	0 32	0 40	0 48	19	0		
	30	0 0	0 6	0 12	0 18	0 25	0 32	0 39	0 48				30
8	0	0 0	0 6	0 11	0 17	0 24	0 30	0 38	0 46	20	0		
	30	0 0	0 5	0 10	0 16	0 22	0 28	0 35	0 42				30
9	0	0 0	0 5	0 9	0 14	0 19	0 25	0 31	0 37	21	0		
	30	0 0	0 4	0 8	0 12	0 16	0 21	0 26	0 31				30
10	0	0 0	0 3	0 6	0 10	0 13	0 17	0 21	0 25	22	0		
	30	0 0	0 2	0 5	0 7	0 10	0 13	0 16	0 19				30
11	0	0 0	0 2	0 3	0 5	0 7	0 9	0 11	0 13	23	0		
	30	0 0	0 1	0 2	0 3	0 4	0 5	0 7	0 8				30
12	0	0 0	0 0	0 1	0 1	0 2	0 3	0 3	0 4	24	0		

TABLE III. (*for 1850.*)Containing the *Third* Correction. (*always to be added.*)*Arguments*:—Sidereal Time and Date.

Sidereal Time.	Jan. 1.	Feb. 1.	March 1.	April 1.	May 1.	June 1.	July 1.
h	' "	' "	' "	' "	' "	' "	' "
0	0 39	0 35	0 28	0 19	0 11	0 7	0 8
2	0 42	0 43	0 40	0 32	0 23	0 18	0 12
4	0 50	0 56	0 58	0 53	0 45	0 36	0 29
6	1 0	1 10	1 15	1 16	1 12	1 3	0 54
8	1 11	1 21	1 29	1 35	1 35	1 29	1 21
10	1 18	1 26	1 35	1 44	1 48	1 48	1 42
12	1 21	1 25	1 32	1 41	1 49	1 53	1 52
14	1 18	1 17	1 20	1 28	1 37	1 42	1 48
16	1 10	1 4	1 2	1 7	1 15	1 24	1 31
18	1 0	0 50	0 45	0 44	0 48	0 57	1 6
20	0 49	0 39	0 31	0 25	0 25	0 31	0 39
22	0 42	0 34	0 25	0 16	0 12	0 12	0 18
24	0 39	0 35	0 28	0 19	0 11	0 7	0 8



# TABLES.

58

TABLE II.

Containing the *Second* Correction. (*always to be added.*)

*Arguments:—Sidereal Time and Altitude.*

Sidereal		Altitude.										Sidereal								
Time.		35°	40°	45°	50°	55°	60°	65°	70°	Time.										
<sup>h</sup> 0	<sup>m</sup> 0	<sup>′</sup> 0	<sup>″</sup> 4	<sup>′</sup> 0	<sup>″</sup> 5	<sup>′</sup> 0	<sup>″</sup> 6	<sup>′</sup> 0	<sup>″</sup> 7	<sup>′</sup> 0	<sup>″</sup> 8	<sup>′</sup> 0	<sup>″</sup> 10	<sup>′</sup> 0	<sup>″</sup> 12	<sup>′</sup> 0	<sup>″</sup> 15	<sup>h</sup> 12	<sup>m</sup> 0	
	30	0	1	0	1	0	2	0	2	0	2	0	3	0	4	0	5		30	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		13	0
	30	0	1	0	1	0	1	0	1	0	1	0	1	0	2	0	2		30	
2	0	0	3	0	3	0	4	0	5	0	5	0	7	0	8	0	10		14	0
	30	0	6	0	7	0	9	0	11	0	13	0	15	0	19	0	24		30	
3	0	0	11	0	13	0	16	0	19	0	23	0	27	0	34	0	43		15	0
	30	0	17	0	20	0	24	0	28	0	34	0	41	0	51	1	6		30	
4	0	0	23	0	27	0	33	0	39	0	47	0	57	1	10	1	30		16	0
	30	0	29	0	35	0	42	0	50	1	0	1	12	1	29	1	55		30	
5	0	0	35	0	42	0	50	1	0	1	12	1	27	1	48	2	18		17	0
	30	0	40	0	48	0	58	1	9	1	22	1	40	2	3	2	38		30	
6	0	0	44	0	53	1	3	1	16	1	30	1	50	2	16	2	54		18	0
	30	0	47	0	56	1	7	1	20	1	36	1	56	2	24	3	5		30	
7	0	0	48	0	58	1	9	1	22	1	38	1	59	2	28	3	9		19	0
	30	0	48	0	57	1	8	1	21	1	37	1	58	2	26	3	7		30	
8	0	0	46	0	55	1	5	1	18	1	33	1	53	2	20	2	59		20	0
	30	0	42	0	50	1	0	1	11	1	26	1	44	2	9	2	45		30	
9	0	0	37	0	45	0	53	1	3	1	16	1	32	1	54	2	26		21	0
	30	0	31	0	38	0	45	0	54	1	4	1	18	1	36	2	4		30	
10	0	0	25	0	30	0	36	0	43	0	52	1	3	1	17	1	39		22	0
	30	0	19	0	23	0	27	0	32	0	39	0	47	0	58	1	15		30	
11	0	0	13	0	16	0	19	0	22	0	27	0	32	0	40	0	51		23	0
	30	0	8	0	9	0	11	0	13	0	16	0	20	0	24	0	31		30	
12	0	0	4	0	5	0	6	0	7	0	8	0	10	0	12	0	15		24	0

TABLE III. (*for 1850.*)

Containing the *Third* Correction. (*always to be added.*)

*Arguments:—Sidereal Time and Date.*

Sidereal Time.	July 1.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.	Dec. 1.	Dec. 31.
<i>h</i>	<i>′ ″</i>	<i>′ ″</i>	<i>′ ″</i>	<i>′ ″</i>	<i>′ ″</i>	<i>′ ″</i>	<i>′ ″</i>
0	0 8	0 14	0 24	0 36	0 47	0 54	0 58
2	0 12	0 13	0 19	0 29	0 41	0 51	0 59
4	0 29	0 25	0 25	0 31	0 40		
6	0 54	0 46	0 41	0 40	0		
8	1 21	1 11	1 2	0 55			
10	1 42	1 33	1 22	1 11			
12	1 52	1 46	1 36	1 24			
14	1 48	1 47	1 41	1 31			
16	1 31	1 35	1 35	1 1			
18	1 6	1 14	1 19	1 1			
20	0 39	0 49	0 58	1			
22	0 18	0 27	0 38	0			
24	0 8	0 14	0 24	0			

TABLE

For converting INTERVALS of MEAN SOLAR Time into Equivalent INTERVALS  
of SIDEREAL Time.

HOURS.			MINUTES.						SECONDS.					
Hours of Mean Time.	Equivalents in Sidereal Time.		Minutes of Mean Time.	Equivalents in Sidereal Time.		Minutes of Mean Time.	Equivalents in Sidereal Time.		Seconds of Mean Time.	Equivalents in Sidereal Time.		Seconds of Mean Time.	Equivalents in Sidereal Time.	
	h	m	s		m	s		m	s		s		s	
1	1	0	9.8565	1	1	0.1643	31	31	5.0925	1	1.0027	31	31.0849	
2	2	0	19.7130	2	2	0.3286	32	32	5.2568	2	2.0055	32	32.0876	
3	3	0	29.5694	3	3	0.4928	33	33	5.4211	3	3.0082	33	33.0904	
4	4	0	39.4259	4	4	0.6571	34	34	5.5853	4	4.0110	34	34.0931	
5	5	0	49.2824	5	5	0.8214	35	35	5.7496	5	5.0137	35	35.0958	
6	6	0	59.1388	6	6	0.9857	36	36	5.9139	6	6.0164	36	36.0986	
7	7	1	8.9953	7	7	1.1499	37	37	6.0782	7	7.0192	37	37.1013	
8	8	1	18.8518	8	8	1.3142	38	38	6.2424	8	8.0219	38	38.1040	
9	9	1	28.7083	9	9	1.4785	39	39	6.4067	9	9.0246	39	39.1068	
10	10	1	38.5647	10	10	1.6428	40	40	6.5710	10	10.0274	40	40.1095	
11	11	1	48.4212	11	11	1.8070	41	41	6.7353	11	11.0301	41	41.1123	
12	12	1	58.2777	12	12	1.9713	42	42	6.8995	12	12.0329	42	42.1150	
13	13	2	8.1342	13	13	2.1356	43	43	7.0638	13	13.0356	43	43.1177	
14	14	2	17.9906	14	14	2.2998	44	44	7.2281	14	14.0383	44	44.1205	
15	15	2	27.8471	15	15	2.4641	45	45	7.3924	15	15.0411	45	45.1232	
16	16	2	37.7036	16	16	2.6284	46	46	7.5566	16	16.0438	46	46.1259	
17	17	2	47.5600	17	17	2.7927	47	47	7.7209	17	17.0465	47	47.1287	
18	18	2	57.4165	18	18	2.9569	48	48	7.8852	18	18.0493	48	48.1314	
19	19	3	7.2730	19	19	3.1212	49	49	8.0495	19	19.0520	49	49.1342	
20	20	3	17.1295	20	20	3.2855	50	50	8.2137	20	20.0548	50	50.1369	
21	21	3	26.9859	21	21	3.4498	51	51	8.3780	21	21.0575	51	51.1396	
22	22	3	36.8424	22	22	3.6140	52	52	8.5423	22	22.0602	52	52.1424	
23	23	3	46.6989	23	23	3.7783	53	53	8.7066	23	23.0630	53	53.1451	
24	24	3	56.5554	24	24	3.9426	54	54	8.8708	24	24.0657	54	54.1479	
				25	25	4.1069	55	55	9.0351	25	25.0685	55	55.1506	
				26	26	4.2711	56	56	9.1994	26	26.0712	56	56.1533	
				27	27	4.4354	57	57	9.3637	27	27.0739	57	57.1561	
				28	28	4.5997	58	58	9.5279	28	28.0767	58	58.1588	
				29	29	4.7640	59	59	9.6922	29	29.0794	59	59.1615	
				30	30	4.9282	60	60	9.8565	30	30.0821	60	60.1643	



TABLE

For converting INTERVALS of MEAN SOLAR Time into Equivalent INTERVALS of SIDEREAL Time.

## FRACTIONS OF A SECOND.

Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.
0.01	0.01003	0.34	0.34093	0.67	0.67183
0.02	0.02006	0.35	0.35096	0.68	0.68186
0.03	0.03008	0.36	0.36099	0.69	0.69189
0.04	0.04011	0.37	0.37101	0.70	0.70192
0.05	0.05014	0.38	0.38104	0.71	0.71194
0.06	0.06016	0.39	0.39107	0.72	0.72197
0.07	0.07019	0.40	0.40110	0.73	0.73200
0.08	0.08022	0.41	0.41112	0.74	0.74203
0.09	0.09025	0.42	0.42115	0.75	0.75205
0.10	0.10027	0.43	0.43118	0.76	0.76208
0.11	0.11030	0.44	0.44120	0.77	0.77211
0.12	0.12033	0.45	0.45123	0.78	0.78214
0.13	0.13036	0.46	0.46126	0.79	0.79216
0.14	0.14038	0.47	0.47129	0.80	0.80219
0.15	0.15041	0.48	0.48131	0.81	0.81222
0.16	0.16044	0.49	0.49134	0.82	0.82225
0.17	0.17047	0.50	0.50137	0.83	0.83227
0.18	0.18049	0.51	0.51140	0.84	0.84230
0.19	0.19052	0.52	0.52142	0.85	0.85233
0.20	0.20055	0.53	0.53145	0.86	0.86235
0.21	0.21057	0.54	0.54148	0.87	0.87238
0.22	0.22060	0.55	0.55151	0.88	0.88241
0.23	0.23063	0.56	0.56153	0.89	0.89244
0.24	0.24066	0.57	0.57156	0.90	0.90246
0.25	0.25068	0.58	0.58159	0.91	0.91249
0.26	0.26071	0.59	0.59162	0.92	0.92252
0.27	0.27074	0.60	0.60165	0.93	0.93255
0.28	0.28077	0.61	0.61168	0.94	0.94258
0.29	0.29079	0.62	0.62171	0.95	0.95261
0.30	0.30082	0.63	0.63174	0.96	0.96264
0.31	0.31085	0.64	0.64177	0.97	0.97267
0.32	0.32088	0.65	0.65180	0.98	0.98270
0.33	0.33090	0.66	0.66183	0.99	0.99273

This table is useful for the conversion of MEAN SOLAR into SIDEREAL Time.

Time required = Sidereal Time at the preceding Mean Noon + the Equivalent to the given Mean Time.

EXAMPLE.—To convert 2<sup>h</sup> 22<sup>m</sup> 25<sup>s</sup>.62 Mean Time at Greenwich, Jan. 2, 1850, into Sidereal Time.

Sidereal Time at the preceding Mean Noon, viz. January 2 . . . . . 18<sup>h</sup> 47<sup>m</sup> 3.93<sup>s</sup>  
 For Mean Intervals. { 2<sup>h</sup> 0<sup>m</sup> 0<sup>s</sup> } The Table gives the Equivalent  
 { 22 0 } Sidereal Intervals, 22 3.61  
 { 25 0 } 25.07  
 { 0.62 } 0.62

The Sum is the Sidereal Time required, 21 9 32.94

TABLE

For converting INTERVALS of SIDEREAL Time into Equivalent INTERVALS of  
MEAN SOLAR Time.

HOURS.		MINUTES.				SECONDS.			
Hours of Sidereal Time.	Equivalents in Mean Time.	Minutes of Sidereal Time.	Equivalents in Mean Time.	Minutes of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.
	<sup>h</sup> <sup>m</sup> <sup>s</sup>		<sup>m</sup> <sup>s</sup>		<sup>m</sup> <sup>s</sup>		<sup>s</sup>		<sup>s</sup>
1	0 59 50.1704	1	0 59.8362	31	30 54.9214	1	0.9973	31	30.91
2	1 59 40.3409	2	1 59.6723	32	31 54.7576	2	1.9945	32	31.91
3	2 59 30.5113	3	2 59.5085	33	32 54.5937	3	2.9918	33	32.90
4	3 59 20.6818	4	3 59.3447	34	33 54.4299	4	3.9891	34	33.90
5	4 59 10.8522	5	4 59.1809	35	34 54.2661	5	4.9864	35	34.90
6	5 59 1.0226	6	5 59.0170	36	35 54.1023	6	5.9836	36	35.90
7	6 58 51.1931	7	6 58.8532	37	36 53.9384	7	6.9809	37	36.89
8	7 58 41.3635	8	7 58.6894	38	37 53.7746	8	7.9782	38	37.89
9	8 58 31.5340	9	8 58.5256	39	38 53.6108	9	8.9754	39	38.89
10	9 58 21.7044	10	9 58.3617	40	39 53.4470	10	9.9727	40	39.89
11	10 58 11.8748	11	10 58.1979	41	40 53.2831	11	10.9700	41	40.88
12	11 58 2.0453	12	11 58.0341	42	41 53.1193	12	11.9672	42	41.88
13	12 57 52.2157	13	12 57.8703	43	42 52.9555	13	12.9645	43	42.88
14	13 57 42.3862	14	13 57.7064	44	43 52.7917	14	13.9618	44	43.87
15	14 57 32.5566	15	14 57.5426	45	44 52.6278	15	14.9591	45	44.87
16	15 57 22.7270	16	15 57.3788	46	45 52.4640	16	15.9563	46	45.87
17	16 57 12.8975	17	16 57.2150	47	46 52.3002	17	16.9536	47	46.87
18	17 57 3.0679	18	17 57.0511	48	47 52.1364	18	17.9509	48	47.86
19	18 56 53.2384	19	18 56.8873	49	48 51.9725	19	18.9481	49	48.86
20	19 56 43.4088	20	19 56.7235	50	49 51.8087	20	19.9454	50	49.86
21	20 56 33.5792	21	20 56.5597	51	50 51.6449	21	20.9427	51	50.86
22	21 56 23.7497	22	21 56.3958	52	51 51.4810	22	21.9399	52	51.85
23	22 56 13.9201	23	22 56.2320	53	52 51.3172	23	22.9372	53	52.85
24	23 56 4.0906	24	23 56.0682	54	53 51.1534	24	23.9345	54	53.85
		25	24 55.9044	55	54 50.9896	25	24.9318	55	54.84
		26	25 55.7405	56	55 50.8257	26	25.9290	56	55.84
		27	26 55.5767	57	56 50.6619	27	26.9263	57	56.84
		28	27 55.4129	58	57 50.4981	28	27.9236	58	57.84
		29	28 55.2490	59	58 50.3343	29	28.9208	59	58.83
		30	29 55.0852	60	59 50.1704	30	29.9181	60	59.83



TABLE

For converting INTERVALS of SIDEREAL Time into Equivalent INTERVALS of MEAN SOLAR Time.

## FRACTIONS OF A SECOND.

Seconds of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.	Seconds of Sidereal Time.	Equivalents in Mean Time.
0.01	0.00997	0.34	0.33907	0.67	0.66817
0.02	0.01995	0.35	0.34904	0.68	0.67814
0.03	0.02992	0.36	0.35902	0.69	0.68812
0.04	0.03989	0.37	0.36899	0.70	0.69809
0.05	0.04986	0.38	0.37896	0.71	0.70806
0.06	0.05984	0.39	0.38894	0.72	0.71803
0.07	0.06981	0.40	0.39891	0.73	0.72801
0.08	0.07978	0.41	0.40888	0.74	0.73798
0.09	0.08975	0.42	0.41885	0.75	0.74795
0.10	0.09973	0.43	0.42883	0.76	0.75793
0.11	0.10970	0.44	0.43880	0.77	0.76790
0.12	0.11967	0.45	0.44877	0.78	0.77787
0.13	0.12965	0.46	0.45874	0.79	0.78784
0.14	0.13962	0.47	0.46872	0.80	0.79782
0.15	0.14959	0.48	0.47869	0.81	0.80779
0.16	0.15956	0.49	0.48866	0.82	0.81776
0.17	0.16954	0.50	0.49864	0.83	0.82773
0.18	0.17951	0.51	0.50861	0.84	0.83771
0.19	0.18948	0.52	0.51858	0.85	0.84768
0.20	0.19945	0.53	0.52855	0.86	0.85765
0.21	0.20943	0.54	0.53853	0.87	0.86762
0.22	0.21940	0.55	0.54850	0.88	0.87760
0.23	0.22937	0.56	0.55847	0.89	0.88757
0.24	0.23934	0.57	0.56844	0.90	0.89754
0.25	0.24932	0.58	0.57842	0.91	0.907
0.26	0.25929	0.59	0.58839	0.92	0.917
0.27	0.26926	0.60	0.59836	0.93	0.927
0.28	0.27924	0.61	0.60833	0.94	0.937
0.29	0.28921	0.62	0.61831	0.95	0.947
0.30	0.29918	0.63	0.62828	0.96	0.957
0.31	0.30915	0.64	0.63825	0.97	0.967
0.32	0.31913	0.65	0.64823	0.98	0.977
0.33	0.32910	0.66	0.65820	0.99	0.987

\* TABLE is useful for the conversion of SIDEREAL into MEAN SOLAR Time.

used = Mean Time at the preceding Sidereal Noon + the Equivalent to the given Sidereal Time.

-To convert 21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94 Sidereal Time at Greenwich, Jan. 2, 1850, into Mean Time.

Time at the preceding Sidereal Noon, viz. - - - - - January 1<sup>h</sup> 5<sup>m</sup> 16<sup>s</sup>.71

21<sup>h</sup> 9<sup>m</sup> 0<sup>s</sup>.00

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

21<sup>h</sup> 9<sup>m</sup> 52<sup>s</sup>.94

The Table gives the Equivalent Mean Intervals.

The Sum is the Mean Time required, Jan. 2 2 22 25.62

# TABLES.

## LATITUDES AND LONGITUDES OF THE PRINCIPAL OBSERVATORIES.

The Longitudes are reckoned from the Meridian of Greenwich.  
 North Latitudes and West Longitudes are indicated by the sign + :  
 South Latitudes and East Longitudes by the sign —.

BERDEEN - - -	(Marischal College.)	
	Lat. + 57° 8' 57".8	} Mr. George Innes, <i>Ast. Nach.</i> vol. x. page 211.
	Long. + 0 <sup>h</sup> 8 <sup>m</sup> 22 <sup>s</sup> .78	
BO - - -	Lat. + 60° 26' 57"	} <i>Argelander's Observations</i> , vol. i. page 21, and vol. ii. pages 25, 27. <i>Ast. Nach.</i> vol. ix. page 264.
	Long. — 1 <sup>h</sup> 29 <sup>m</sup> 8 <sup>s</sup> .8	
ELTONA - - -	(Prof. Schumacher.)	
	Lat. + 53° 32' 45"	} <i>Gauss on the Latitudes of Göttingen and Altona</i> , page 71. (Göttingen, 1828.) <i>Ast. Nach.</i> vol. viii. page 132.
	Long. — 0 <sup>h</sup> 39 <sup>m</sup> 46 <sup>s</sup> .6	
ERMAGH - - -	Lat. + 54° 21' 12".7	} Communicated by the Rev. Dr. Robinson.
	Long. + 0 <sup>h</sup> 26 <sup>m</sup> 35 <sup>s</sup> .5	
ASHURST - - -	(R. Snow, Esq.)	
	Lat. + 51° 15' 58"	} <i>Monthly Notices of the Royal</i> <i>Ast. Soc.</i> vol. v. page 232.
	Long. + 0 <sup>h</sup> 1 <sup>m</sup> 10 <sup>s</sup> .1	
BEDFORD - - -	(Capt. Smyth, R.N.)	
	Lat. + 52° 8' 27".6	} <i>Mem. Ast. Soc.</i> vol. v. page 370.
	Long. + 0 <sup>h</sup> 1 <sup>m</sup> 51 <sup>s</sup> .97	
BERLIN - - -	Lat. + 52° 31' 13".5	} <i>Berliner Astron. Jahrbuch</i> for 1833, page 249.
	Long. — 0 <sup>h</sup> 53 <sup>m</sup> 35 <sup>s</sup> .5	
— (New Observ <sup>y</sup> )	Lat. + 52° 30' 16".0	} <i>Berliner Astron. Jahrbuch</i> for 1839, page 240.
	Long. — 0 <sup>h</sup> 53 <sup>m</sup> 35 <sup>s</sup> .3	
BLACKHEATH - - -	(Hon. J. Wrottesley.)	
	Lat. + 51° 28' 2"	} <i>Mem. of Royal Ast. Soc.</i> vol. x. page 161.
	Long. — 0 <sup>h</sup> 0 <sup>m</sup> 2 <sup>s</sup> .7	
BREMEN - - -	Lat. + 53° 4' 36"	} <i>Ast. Nach.</i> vol. i. page 240. This is the mean of the results given in <i>Ast. Nach.</i> vol. i. page 240; vol. iv, page 392; vol. v. page 247; vol. viii. pages 131 and 284.
	Long. — 0 <sup>h</sup> 35 <sup>m</sup> 15 <sup>s</sup> .9	
BRUSSELS - - -	(Prof. Quetelet.)	
	Lat. + 50° 51' 10".7	} <i>Annuaire de l'observatoire de</i> <i>Bruxelles, pour l'An 1837</i> , pages 264 and 265.
	Long. — 0 <sup>h</sup> 17 <sup>m</sup> 29 <sup>s</sup> .0	



LATITUDES AND LONGITUDES OF THE PRINCIPAL  
OBSERVATORIES.

BUDA - - - - -	(Ofen.)		
	Lat. + 47° 29' 12".2	<i>Zeitschrift für Astronomie</i> , vol. i.	
		page 70; and <i>Mem. Ast. Soc.</i> vol. i. page 280.	
	Long. — 1 <sup>h</sup> 16 <sup>m</sup> 12 <sup>s</sup> .7	<i>Zach's Correspond. Astron.</i> vol. i.	
		page 263; and <i>Zeitschrift für Astronomie</i> , vol.	
		page 507.	
BUSHEY HEATH - - -	(Colonel Beaufoy.)		
	Lat. + 51° 37' 44".3	} <i>Mem. Ast. Soc.</i> vol. ii. page 129	
	Long. + 0 <sup>h</sup> 1 <sup>m</sup> 20 <sup>s</sup> .93		
CAMBRIDGE - - -	Lat. + 52° 12' 51".8	<i>Camb. Phil. Trans.</i> vol. v. p. 27	
	Long. — 0 <sup>h</sup> 0 <sup>m</sup> 23 <sup>s</sup> .54	<i>Camb. Phil. Trans.</i> vol. iii. p. 16	
CAPE OF GOOD HOPE -	Lat. — 33° 56' 3"	<i>Mem. Roy. Ast. Soc.</i> vol. i.	
		page 130.	
	Long. — 1 <sup>h</sup> 13 <sup>m</sup> 55 <sup>s</sup> .0	Communicated by Mr. Henders	
CHRISTIANA - - -	Lat. + 59° 54' 5"	<i>Ast. Nach.</i> vol. vi. page 148.	
	Long. — 0 <sup>h</sup> 42 <sup>m</sup> 59 <sup>s</sup> .8	<i>Ast. Nach.</i> vol. v. page 382.	
COPENHAGEN - - -	(University.)		
	Lat. + 55° 40' 53"	<i>Ast. Nach.</i> vol. v. page 366.	
	Long. — 0 <sup>h</sup> 50 <sup>m</sup> 19 <sup>s</sup> .8	<i>Ast. Nach.</i> vol. ix. page 164.	
CRACOW - - - -	Lat. + 50° 3' 49".7	<i>Ast. Nach.</i> vol. viii. page 176;	
		and vol. x. page 228.	
	Long. — 1 <sup>h</sup> 19 <sup>m</sup> 52 <sup>s</sup> .45	<i>Ast. Nach.</i> vol. x. page 232.	
DORPAT - - - -	Lat. + 58° 22' 47"	<i>Struve's Astronom. Observation.</i>	
		vol. vi. page 60.	
	Long. — 1 <sup>h</sup> 46 <sup>m</sup> 55 <sup>s</sup>	<i>Bessel's Tabulæ Regiomontanae</i>	
		page 2.	
DUBLIN - - - -	Lat. + 53° 23' 13"	} <i>Ast. Nach.</i> vol. x. page 274.	
	Long. + 0 <sup>h</sup> 25 <sup>m</sup> 22 <sup>s</sup>		
DURHAM - - - -	Lat. + 54° 46' 14".9	} Communicated by Professor	
	Long. + 0 <sup>h</sup> 6 <sup>m</sup> 18 <sup>s</sup>		
		Chevallier.	
EDINBURGH - - -	Lat. + 55° 57' 23".2	<i>Ast. Soc. Not.</i> vol. iii. page 201	
	Long. + 0 <sup>h</sup> 12 <sup>m</sup> 43 <sup>s</sup> .6	<i>Mem. Ast. Soc.</i> vol. i. page 568	
FLORENCE - - - -	(St. Giovanni.)		
	Lat. + 43° 46' 41".4	} <i>Zach's Correspond. Astron.</i>	
	Long. — 0 <sup>h</sup> 45 <sup>m</sup> 3 <sup>s</sup> .6		
		<i>mique</i> , vol. i.	
GENEVA - - - -	Lat. + 46° 11' 53"	<i>Mémoire sur l'observation</i>	
		<i>Genève</i> , 1801	
		<i>Ast. Nach.</i>	
	Long. — 0 <sup>h</sup> 24 <sup>m</sup> 37 <sup>s</sup>		

## LATITUDES AND LONGITUDES OF THE PRINCIPAL OBSERVATORIES.

GOTHA - - - - -	(Seeberg.)		
	Lat. + 50° 56' 5"	<i>Gauss on the Latitudes of Göttingen and Altona, page 80</i>	
	Long. — 0 <sup>h</sup> 42 <sup>m</sup> 56 <sup>s</sup> .4	<i>Bessel's Tab. Reg. page 2.</i>	
GÖTTINGEN - - -	Lat. + 51° 31' 48"	<i>Gauss on the Latitudes of Göttingen and Altona, page 71.</i>	
	Long. — 0 <sup>h</sup> 39 <sup>m</sup> 46 <sup>s</sup> .5	<i>Bessel's Tab. Reg. page 2.</i>	
GREENWICH - - -	Lat. + 51° 28' 38" .2	<i>Greenwich Observations, 18</i>	
	Long. 0 <sup>h</sup> 0 <sup>m</sup> 0 <sup>s</sup>	<i>page lvii.</i>	
KENSINGTON - - -	(Sir James South.)		
	Lat. + 51° 30' 12" .7	} <i>Mem. Ast. Soc. vol. v. page 37</i>	
	Long. + 0 <sup>h</sup> 0 <sup>m</sup> 46 <sup>s</sup> .78		
KEW - - - - -	Lat. + 51° 28' 37"	} <i>Baily's Astron. Tables and Formulæ, page 123. (London, 18</i>	
	Long. + 0 <sup>h</sup> 1 <sup>m</sup> 3 <sup>s</sup>		
KÖNIGSBERG - - -	Lat. + 54° 42' 50"	<i>Introduction to Bessel's Astr. Observations for 1821.</i>	
	Long. — 1 <sup>h</sup> 22 <sup>m</sup> 0 <sup>s</sup> .5	<i>Bessel's Tab. Reg. page 2.</i>	
KREMSMUNSTER - -	Lat. + 48° 3' 29"	<i>Ast. Nach. vol. vi. page 67.</i>	
	Long. — 0 <sup>h</sup> 56 <sup>m</sup> 32 <sup>s</sup> .3	<i>Ast. Nach. vol. iii. page 121.</i>	
LIVERPOOL - - -	Lat. + 53° 24' 47" .8	<i>Communicated by Mr. Hartnup</i>	
	Long. + 0 <sup>h</sup> 12 <sup>m</sup> 0 <sup>s</sup> .11		<i>G. B. Airy, F</i>
MADRAS - - - - -	Lat. + 13° 4' 9" .2	} <i>Taylor's Result of Ast. Obs. the Observatory, vol. i. 18</i>	
	Long. — 5 <sup>h</sup> 21 <sup>m</sup> 3 <sup>s</sup> .77		<i>pages 94 &amp; 95. (Madras, 183</i>
MAKERSTOUN - - -	(Sir T. M. Brisbane.)		
	Lat. + 55° 34' 45"	} <i>Ast. Nach. vol. x. page 214.</i>	
	Long. + 0 <sup>h</sup> 10 <sup>m</sup> 4 <sup>s</sup> .0		
MANHEIM - - - - -	Lat. + 49° 29' 14"	<i>Zach's Correspondance Astronomique, vol. i. page 193.</i>	
	Long. — 0 <sup>h</sup> 33 <sup>m</sup> 51 <sup>s</sup> .4	<i>Ast. Nach. vol. ii. page 398.</i>	
MARSEILLES - - -	Lat. + 43° 17' 50" .1	<i>Zach's Attraction des Montagnes, vol. ii. page 591.</i>	
	Long. — 0 <sup>h</sup> 21 <sup>m</sup> 29 <sup>s</sup> .0	<i>Ast. Nach. vol. iv. page 36.</i>	
MILAN - - - - -	(Brera.)		
	Lat. + 45° 28' 1"	<i>Zach's Correspondance Astronomique, vol. v. page 300.</i>	
	Long. — 0 <sup>h</sup> 36 <sup>m</sup> 47 <sup>s</sup> .2	<i>Ast. Nach. vol. ix. page 312.</i>	
MODENA - - - - -	Lat. + 44° 38' 53"	} <i>Effem. Astron. di Milano for 18</i>	
	Long. — 0 <sup>h</sup> 43 <sup>m</sup> 43 <sup>s</sup> .2		<i>pages 94 and 60.</i>



LATITUDES AND LONGITUDES OF THE PRINCIPAL  
OBSERVATORIES.

MUNICH	- - - -	(Bogenhausen.)	
		Lat. $+ 48^{\circ} 8' 45''$	<i>Ast. Nach.</i> vol. i. page 221.
		Long. $- 0^h 46^m 26^s \cdot 5$	<i>Ast. Nach.</i> vol. viii. page 148.
NAPLES	- - - -	(Capo di Monte.)	
		Lat. $+ 40^{\circ} 51' 46'' \cdot 6$	<i>Ast. Nach.</i> vol. v. page 294.
		Long. $- 0^h 57^m 0^s \cdot 3$	Communicated by M. Cacciatore to Captain B. Hall, R.N.
NICOLÆFF	- - - -	Lat. $+ 46^{\circ} 58' 20'' \cdot 6$	<i>Ast. Nach.</i> vol. vii. page 261.
		Long. $- 2^h 7^m 55^s \cdot 1$	<i>Ast. Nach.</i> vol. vii. page 306.
ORMSKIRK	- - - -	Lat. $+ 53^{\circ} 34' 0''$	} Communicated by Rev. W. R. Dawes.)
		Long. $+ 0^h 11^m 29^s \cdot 4$	
OXFORD	- - - -	Lat. $+ 51^{\circ} 45' 40''$	} <i>Requisite Tables</i> , 3rd edit. (from Trig. Survey.)
		Long. $+ 0^h 5^m 1^s \cdot 5$	
PADUA	- - - -	Lat. $+ 45^{\circ} 24' 2''$	<i>Ast. Nach.</i> vol. v. page 411.
		Long. $- 0^h 47^m 29^s \cdot 2$	<i>Ast. Nach.</i> vol. iv. page 347.
PALERMO	- - - -	Lat. $+ 38^{\circ} 6' 44''$	<i>Cacciatore</i> , in Books 7 and 8 of <i>Palermo Observations</i> .
		Long. $- 0^h 53^m 25^s \cdot 6$	Communicated by M. Cacciatore to Captain B. Hall, R.N.
PARAMATTA	- - - -	Lat. $- 33^{\circ} 48' 49'' \cdot 8$	} <i>Phil. Trans.</i> for 1829. Part iii. pages 16 and 29.
		Long. $- 10^h 4^m 6^s \cdot 25$	
PARIS	- - - -	Lat. $+ 48^{\circ} 50' 13''$	<i>Conn. des Tems</i> for 1835, page 356.
		Long. $- 0^h 9^m 21^s \cdot 5$	<i>Phil. Trans.</i> for 1827. ( <i>Hender- son on the Longitudes of Green- wich and Paris.</i> )
PETERSBURGH	- - - -	Lat. $+ 59^{\circ} 56' 31''$	<i>Conn. des Tems</i> for 1836, page 340.
		Long. $- 2^h 1^m 15^s \cdot 8$	<i>Ast. Nach.</i> vol. viii. page 360.
PORTSMOUTH	- - - -	Lat. $+ 50^{\circ} 48' 3''$	} <i>Requisite Tables</i> , 3rd edit. (from Trig. Survey.)
		Long. $+ 0^h 4^m 23^s \cdot 9$	
PRAGUE	- - - -	Lat. $+ 50^{\circ} 5' 18'' \cdot 5$	<i>Ast. Nach.</i> vol. ... page 198.
		Long. $- 0^h 57^m 41^s \cdot 9$	<i>Ast. Nach.</i> vol. ... page 264.
PULKOWA	- - - -	Lat. $+ 59^{\circ} 46' 11'' \cdot 6$	} <i>Berliner Jahrbuch</i> , 1825.
		Long. $- 2^h 1^m 15^s \cdot 8$	
REGENT'S PARK	- - - -	(George Bishop.)	
		Lat. $+ 51^{\circ} 31' 30''$	} Communicated by W. R. Dawes.
		Long. $+ 0^h 11^m 29^s \cdot 4$	
ROME	- - - -	(Roman College.)	
		Lat. $+ 41^{\circ} 54' 20''$	<i>Conn. des Tems</i> for 1835, page 312.
		Long. $- 0^h 11^m 29^s \cdot 4$	<i>Ast. Nach.</i> vol. ... page 264.

**LATITUDES AND LONGITUDES OF THE PRINCIPAL  
OBSERVATORIES.**

ST. FERNANDO, near CADERE - - -	Lat. + 36° 27' 45" or 42"	<i>Zach's Correspondance Astron- mique</i> , vol. xiv. pages 241 243.
	Long. + 0 <sup>h</sup> 24 <sup>m</sup> 49 <sup>s</sup> .1	<i>Ast. Nach.</i> vol. ix. page 358.
ST. HELENA - - -	Lat. - 15° 55' 26" Long. + 0 <sup>h</sup> 32 <sup>m</sup> 50 <sup>s</sup>	} Communicated by Lieut. John
SLOUGH - - - -	(Sir J. F. W. Herschel.) Lat. + 51° 30' 20" Long. + 0 <sup>h</sup> 2 <sup>m</sup> 24 <sup>s</sup>	} <i>Baily's Astron. Tables and I nula</i> , p. 124. (London, 18
SOUTH KILWORTH -	(Rev. W. Pearson.) Lat. + 52° 25' 51" Long. + 0 <sup>h</sup> 4 <sup>m</sup> 26 <sup>s</sup> .0	} <i>Pearson's Astronomy</i> , vol. ii. p 707.
SPRYER - - - -	Lat. + 49° 18' 55 <sup>s</sup> .2 Long. - 0 <sup>h</sup> 23 <sup>m</sup> 46 <sup>s</sup> .5	} <i>Schwerd's Observations</i> . Pa page xx. <i>Ast. Nach.</i> vol. iii. page 46.
STRASSBURGH - - -	Lat. + 48° 34' 40" Long. - 0 <sup>h</sup> 31 <sup>m</sup> 0 <sup>s</sup> .8	} <i>Comptes Rendus Hebdomada des Séances de L'Académie Sciences</i> . 2nd Semestre. 1836, page :
TURIN - - - -	(New Observatory.) Lat. + 45° 4' 6" Long. - 0 <sup>h</sup> 30 <sup>m</sup> 48 <sup>s</sup> .4	} Communicated by M. Plana Captain B. Hall, R.N.
VERONA - - - -	(Lyceum.) Lat. + 45° 26' Long. - 0 <sup>h</sup> 44 <sup>m</sup> 0 <sup>s</sup> .1	(Approximate.) <i>Effem. Astron. di Milano</i> for 18 page 60.
VIENNA - - - -	Lat. + 48° 12' 35" Long. - 1 <sup>h</sup> 5 <sup>m</sup> 31 <sup>s</sup> .9	} <i>Littrow's Astron. Observati Part viii.</i> page 124. <i>Ast. Nach.</i> vol. iii. page 64.
VIVIERE - - - -	(M. Flaugergues.) Lat. + 44° 29' 11" Long. - 0 <sup>h</sup> 18 <sup>m</sup> 44 <sup>s</sup> .8	} <i>Zach's Correspondance Astr- mique</i> , vol. ii. page 138. <i>Ast. Nach.</i> vol. v. page 252.
WILNA - - - -	Lat. + 54° 41' 0" Long. - 1 <sup>h</sup> 41 <sup>m</sup> 11 <sup>s</sup> .9	} <i>Ast. Nach.</i> vol. iv. page 562. <i>Ast. Nach.</i> vol. viii. page 96.



## EXPLANATION OF THE ARTICLES

CONTAINED IN

THE NAUTICAL ALMANAC AND ASTRONOMICAL EPHEMERIS  
FOR THE YEAR 1850.

ALL the articles of the Ephemeris have been computed for Greenwich MEAN solar time; and where they are given for apparent solar or sidereal time, it has been chiefly for the convenience of astronomers. A *day* is the interval of time between the departure of any meridian from a heavenly body and its succeeding return to it, and derives its name from the body with which the motion of the meridian is compared. The interval between the departure and return of a meridian to the Sun is called a *solar day*; in the case of the Moon, the interval is called a *lunar day*; and in that of a Star, a *sidereal day*. The revolution of the Earth on its axis is always performed in the same time; and if the heavenly bodies preserved the same positions with respect to each other, the intervals between the departure and return of a meridian to each would be the same, and all days, consequently, of equal length. The Sun, (or, more strictly, the Earth in its orbit,) the Moon, and the Planets are, however, in continual motion; and with velocities not only different from each other, but varying in each particular body: the length of a day, as determined by any of these bodies, is therefore a variable quantity.

Astronomers, with the view of obtaining a convenient and uniform measure of time, have recourse to a *mean solar day*, the length of which is equal to the mean or average of all the apparent solar days in a year. An imaginary Sun, called the *mean Sun*, is conceived to move uniformly in the Equator with the real Sun's *mean* motion in Right Ascension, and the interval between the departure of any meridian from the *mean Sun* and its succeeding return to it is the duration of the mean solar day. Clocks and Chronometers are adjusted to mean solar time; so that a complete revolution (through 24 hours) of the hour hand of one of these machines should be performed in exactly the same interval as the revolution of the Earth on its axis with respect to the mean Sun. If the mean Sun could be observed on the meridian at the instant that the clock or chronometer indicated  $0^h 0^m 0^s$ , it would again be observed there when the hour hand returned to the same position. As the time deduced from observations of the *true Sun* is called *true* or *apparent* time, so the time deduced from the *mean Sun*, or indicated by the machines which represent its motion, is called *mean time*.

We cannot immediately obtain mean time from observations of the true Sun, with the aid of the distance in time between the mean and the true Sun. Suppose the true Sun to be observed on the meridian; it would then be apparent noon at that meridian. If it is  $3^m 51^s.17$ , and, by the precept at the head

; but,  
which  
may re-  
vick



*apparent time*"; hence it appears that the corresponding mean time is  $0^h 3^m 51^s \cdot 17$ , or that the mean Sun had passed the meridian previously to the true Sun, and that at the instant of observation the mean time clock or chronometer ought to indicate this time.

A mere inspection of the columns of the Ephemeris is, of itself, sufficient to show that the quantities are continually varying, and that some reduction is necessary where data are to be obtained for any time differing from that for which the quantities are registered. Take, for instance, the Sun's Right Ascension on Page II. of the month of January; on January 1, it is  $18^h 46^m 58^s \cdot 47$ ; on January 2, it is  $18^h 51^m 23^s \cdot 16$ ; in the course of 24 mean hours it has therefore increased by  $4^m 24^s \cdot 69$ . If, then, the Right Ascension were required for any time between the Mean Noons of January 1 and 2, as at  $6^h$  from Mean Noon of January 1, it would be necessary to increase the Right Ascension on January 1, by the proportional part of the daily increase due for the  $6^h$ , viz. by one-fourth part, or  $1^m 6^s \cdot 17$ . This would in all cases be required, even under the meridian of Greenwich, for which the quantities have been specially computed. Let a person be now supposed to be under a meridian  $15^\circ$  West of Greenwich. The positions of the heavenly bodies, as referred to the centre of the Earth, are independent of meridians, and are the same for all places at the same absolute instant; but the relative times at Greenwich and the assumed meridian would be different. If it were  $1^h$  from mean noon at the one place, it could not be  $1^h$  from mean noon at the other; for when we speak of time, we mean, as regards a visible phenomenon, the distance of the Sun *westward* from a given meridian, and at the same absolute moment of time the Sun *cannot* be at the same distance (*reckoning westward*) from two meridians which are  $15^\circ$  distant from each other. Before we can make use of the Ephemeris, it is therefore necessary to ascertain, in every instance, the distance of the Sun (*in time*) from the meridian of Greenwich, or what is commonly called the corresponding Greenwich time; and this is evidently equal to the given time under the assumed meridian, *increased* or *diminished* by the difference (*in time*) of the two meridians, according as the assumed meridian is to the *Westward* or *Eastward* of Greenwich. In a mean Solar day, or 24 mean Solar hours, the Earth, by its rotation from West to East, has caused every meridian in succession from East to West to pass the mean Sun; and since the motion is uniform, all the meridians distant from each other  $15^\circ$  will have passed the mean Sun, at intervals of one mean hour; the meridian to the Eastward passing first, or being, as compared with the Sun, always one mean hour in advance of the Westerly meridian. When it is  $6^h$  from mean noon at a place  $15^\circ$  West of Greenwich, it is therefore  $7^h$  from mean noon at Greenwich; and it is for this Greenwich time that we must deduce the quantities required from the Ephemeris.

If a chronometer adjusted to Greenwich mean time be at hand, the Greenwich time may be immediately obtained by applying a correction, deduced from the daily rate and interval elapsed, and this will be preferable in all cases for obtaining the requisite data from the Ephemeris.

The day adopted in this Ephemeris is supposed to begin at mean noon, or at the instant when a clock or chronometer shows  $0^h 0^m 0^s$ , Greenwich mean time, and is continued through the 24 hours, to the following mean noon, when another day begins. It may therefore be called the *Mean Astronomical Day*, although, in practice, astronomers begin the day at the moment the true Sun's centre is on their meridian.

In the civil, or common, method of reckoning, the day is supposed to commence at the *preceding* midnight, and to be counted only to 12 hours or noon, when the 12 hours are reckoned over again to the next midnight. The civil reckoning is therefore always  $12^h$  in advance of the astronomical reckoning: and the civil time corresponding



to any given astronomical time is hence readily found by *adding*  $12^h$  to the latter: thus, if to Jan.  $1^d 7^h 49^m$ , astronomical time, be added  $12^h$ , the sum will be Jan.  $1^d 19^h 49^m$ , or Jan.  $1^d 7^h 49^m$  P.M. civil time. Again, to Jan.  $1^d 15^h 35^m$ , astronomical time, add  $12^h$ ; the sum will be Jan.  $2^d 3^h 35^m$  A.M. civil time. It thus appears that, from noon to midnight, the day of the month and the hour of the day are the same in both methods; but from midnight to noon they differ; for at midnight, when a new civil day commences, the astronomical day wants  $12^h$  of its completion.

The conversion of civil into astronomical time is, on the contrary, performed by *diminishing* the former by  $12^h$ . Thus, January  $2^d 3^h 35^m$  A.M. civil time, diminished by  $12^h$ , leaves January  $1^d 15^h 35^m$ , for the corresponding astronomical time.

To each month there are devoted twenty-two pages, distinguished by the Roman numerals I. to XXII.

For convenience of interpolation, the quantities that follow next in order of succession have been added at the bottom of each page. Thus the quantities opposite to February 1 will be found inserted also opposite to January 32, the number of the days in each month having been intentionally increased for such purpose.

#### Page I. of each Month.

The contents of this page are adapted to *Apparent Noon*, or the instant when the Sun's centre is on the meridian of Greenwich. The *Sun's Right Ascension*, here given, is *affected with Aberration*, and reckoned from the true Equinox; it is therefore the Sidereal Time at Apparent Noon, or the time which ought to be shown by a Sidereal Clock, at that instant. The *Sun's Apparent Declination* is the angular distance of the Sun from the Equator, measured on the meridian.

The columns entitled "Diff. for 1 hour" are intended to facilitate the reduction of the quantities from Apparent Noon to any other time. The values of these quantities for any proposed *mean* time will, however, be more accurately ascertained by means of the numbers on page II. from which, indeed, they have been derived.

The *Sidereal Time of the Sun's Semidiameter passing the Meridian* is useful for reducing a transit observation of either limb of the Sun, when one only has been observed, to the transit of the centre.

The *Equation of Time* is the difference between Apparent and Mean Time, and therefore serves for the conversion of either time into the other. The numbers here given, show, for Greenwich Apparent Noon, the distance of the mean Sun from the meridian, or the portion of time to be *added to*, or *subtracted from*, (according to the precept at the head of the column,) Greenwich Apparent Noon to obtain the corresponding Mean Time at the same meridian, or the time which ought to be shown by the Mean Time Clock. It differs from the Equation of Time on page II., because the equation itself varies in the interval between Apparent and Mean Noon.

Where time is deduced from observations of the Sun, the *immediate result* is *apparent time*; to convert it into mean time, the equation of time is needed, and it is to be applied to apparent time, according to the precept at the head of the column.

Thus, suppose the apparent time deduced from an observation of the Sun, on January 16, 1850, in longitude  $45^\circ$  or  $3^h$  east of Greenwich, to be  $6^h$ , as required to convert it into mean time: Subtracting the difference of longitude from the apparent time at the place, we have  $3^h$  for the corresponding apparent time at Greenwich. The difference of the equation for 1 hour is  $2^m$ .



3, gives  $2^{\text{h}} 52^{\text{m}} 0$  for the variation in 3 hours, and this being added (because the equation is increasing) to  $10^{\text{m}} 4^{\text{h}} 92$ , the equation of time at apparent noon, the result is  $10^{\text{m}} 7^{\text{h}} 44$ , to be added (according to the precept at the head of the column) to the given apparent time  $6^{\text{h}}$ , whence we obtain  $6^{\text{h}} 10^{\text{m}} 7^{\text{h}} 44$ , for the mean time required.

At page I. of the month of April, we observe, at the head of the column *added to* *subt. from*, which signifies that a change of precept occurs in the course of the month; and between the equations opposite to the 15th and 16th days of the month, a black line, indicating that the change occurs between the Apparent Noons of those days. The upper precept applies to all the quantities above the black line; and the lower precept to all the quantities below it: that is, in the instance referred to, the Equation of Time is to be *added to* Apparent Time from the 1st of April to the instant at which the equation becomes  $0^{\text{m}} 0^{\text{h}}$ , which happens between the noons of the 15th and 16th days of the month: but after that instant the equation is to be *subtracted* from Apparent to obtain Mean Time.

#### Page II. of each Month.

The *Sun's Apparent Right Ascension* and *Declination* at mean noon have been deduced from its *Apparent* longitude and latitude given at page III., and the *apparent* obliquity of the ecliptic at page 266. They denote the *apparent* position of the true Sun with reference to the equator, and the true equinox, at the instant the Greenwich mean time clock, or chronometer, indicates  $0^{\text{h}} 0^{\text{m}} 0^{\text{s}}$ , or when the hour angle of the true Sun is equal to the equation of time.

To find the Right Ascension and Declination for any other mean time and place, as at  $9^{\text{h}} 20^{\text{m}}$  A.M. March 2, 1850, in longitude  $98^{\circ}$ , or  $6^{\text{h}} 32^{\text{m}}$ , West of Greenwich. The astronomical time, corresponding to  $9^{\text{h}} 20^{\text{m}}$  A.M. March 2, is  $21^{\text{h}} 20^{\text{m}}$  from the noon of March 1, or March  $1^{\text{d}} 21^{\text{h}} 20^{\text{m}}$ , agreeably to what has been said before. The longitude, being West of Greenwich, must be added to March  $1^{\text{d}} 21^{\text{h}} 20^{\text{m}}$ , and the result, March  $2^{\text{d}} 3^{\text{h}} 52^{\text{m}}$ , is the corresponding Greenwich mean time, for which the Right Ascension and Declination are to be found. The difference between the Right Ascensions on March 2 and March 3 is  $3^{\text{m}} 43^{\text{s}} 84$ , that is, in the 24 mean hours succeeding the Mean Noon of March 2, the Right Ascension has increased by this quantity; it will, therefore, have received a proportional part of the increase in  $3^{\text{h}} 52^{\text{m}}$ , and the amount is readily obtained by this proportion,  $24^{\text{h}} : 3^{\text{m}} 43^{\text{s}} 84 :: 3^{\text{h}} 52^{\text{m}} : 36^{\text{s}} 06$ ; which, being *added* to  $22^{\text{h}} 52^{\text{m}} 5^{\text{s}} 14$ , the Right Ascension at Mean Noon of March 2, gives  $22^{\text{h}} 52^{\text{m}} 41^{\text{s}} 20$ , for the Right Ascension at the time proposed.

In a similar manner the Declinations indicate a decrease of  $22' 55'' 9$  in the 24 hours; therefore  $24^{\text{h}} : 22' 55'' 9 :: 3^{\text{h}} 52^{\text{m}} : 3' 41'' 7$ , the proportional part of the decrease for  $3^{\text{h}} 52^{\text{m}}$ , which, *subtracted* from  $S. 7^{\circ} 13' 16'' 6$ , leaves  $S. 7^{\circ} 9' 34'' 9$  for the Declination required.

*The Semidiameter of the Sun.* The numbers in this column express the angle at the centre of the earth subtended by the Sun's Semidiameter, and are required for reducing observations of the limb to the centre, as in the instance of measuring the altitude of the Sun's upper or lower limb, or the distance of the Moon from the Sun.

*Equation of Time.* The numbers in this column are the values of the equation at the instant of Mean Noon, and therefore serve more particularly to convert *Mean* into *Apparent* Time; for which purpose we have only to apply the equation according to the precept at the head of the column. Thus, if from mean noon of April 1, or



12<sup>h</sup>, be subtracted the equation 3<sup>m</sup>59<sup>s</sup>15, the difference 11<sup>h</sup> 56<sup>m</sup> 0<sup>s</sup>85 is the corresponding apparent time. To find the equation of time at 8<sup>h</sup> P.M. mean time on April 15, 1850, in longitude 30°, or 2<sup>h</sup> 0<sup>m</sup>, West of Greenwich. Add the difference of longitude to the given time, because it is West, and the corresponding astronomical mean time at Greenwich is April 15<sup>d</sup> 10<sup>h</sup> 0<sup>m</sup>. The variation in 24 hours is 14<sup>m</sup>75, that is, the *sum* of the equations belonging to the noons of the 15th and 16th, because the equation has decreased to 0 and then increased in the interval, therefore

$$24^h : 14^m 75 : 10^h 0^m : 6^m 15,$$

which, being greater than 0<sup>m</sup> 3<sup>m</sup>16, the equation on the 15th, which was decreasing, shows that in the 10<sup>h</sup> 0<sup>m</sup> the equation has passed through its state of decrease to zero, or 0, and is now increasing. The difference 2<sup>m</sup>99 is the equation of time at the time proposed, and is to be added to mean time, because it has passed the zero.

*Sidereal Time at Mean Noon* is the angular distance of the First point of Aries, or the true Vernal Equinox, from the meridian, at the instant of Mean Noon: it is therefore the Right Ascension of the Mean Sun, or the time which ought to be shown by a Sidereal Clock at Greenwich, when the Mean Time Clock indicates 0<sup>h</sup> 0<sup>m</sup> 0<sup>s</sup>.

A Sidereal Clock represents the rotation of the Earth on its axis, as referred to the Stars, its hour-hand performing a complete revolution through the 24 hours in the interval between the departure of any meridian from a Star and its next return to it. At the moment that the Vernal Equinox, or a Star whose Right Ascension is 0<sup>h</sup> 0<sup>m</sup> 0<sup>s</sup>, is on the meridian of Greenwich, the Sidereal Clock ought to show 0<sup>h</sup> 0<sup>m</sup> 0<sup>s</sup>, and at the succeeding return of the Star, or the Equinox, to the same meridian, the Clock ought to indicate the same time.

The sidereal time here given is that in common use among astronomers, and expresses the actual hour-angle from the meridian, westward, of the true equinoctial point at the moment of observation. It is therefore affected by the equation of the equinoxes; and is not, strictly speaking, a *mean* or uniformly increasing quantity. It ought, therefore, to be termed *apparent sidereal time* in the same manner as apparent solar time reckons from the actual arrival of the sun's centre on the meridian; and in like manner, as mean solar time is reckoned from the arrival of an imaginary sun, moving uniformly with its mean velocity, so *mean sidereal time* (whose expression would be simply  $\frac{\odot\text{'s mean longitude}}{15}$ ) would be reckoned from the transit of, not the

*true*, but the *mean* equinoctial point. The smallness of the fluctuations to which a clock, regulated to *apparent* sidereal time compared with one regulated to *mean* sidereal time, is subject, being at the utmost only 2<sup>m</sup>3 in a period of nineteen years, has prevented the practical inconvenience of this from being felt: no clock being sufficiently perfect to go during so long a period without frequent re-adjusting; and as the corrections applied by astronomers to the observed right ascensions of all objects are adapted to this supposed irregularity in the rate of the clock, the mean right ascensions thence deduced come out correct. It has, therefore, not been thought necessary, in this instance, to depart from received usage, however theoretically objectionable such a mode of counting time may appear, since a change in this respect would involve the necessity of a corresponding change in all tables of nutation.

The Sidereal time at Mean Noon is useful in all cases where mean solar time is to be deduced from observations of the heavenly bodies. It serves to facilitate the reduction of sidereal to mean solar time, and *vice versâ*, by the help of the tables commonly used for that purpose, called a Table of Acceleration of Sidereal on Mean



Solar Time, and the corresponding Table of Retardation of Mean on Sidereal Time, according to the following rule:—Convert the interval from the mean noon immediately preceding, from the denomination given, to that required; and if mean time be required, the result will at once be that which the clock should show; but if sidereal time be that sought, the result must be added to the sidereal time at the preceding mean noon.

*Example:*—To convert  $21^h 9^m 24^s.04$  sidereal time, Jan. 2, 1850, into mean solar time, for the meridian of Greenwich.

	h	m	s
Sidereal time given - - - - -	21	9	24.04
Sidereal time at mean noon, January 2 - - - - -	18	47	3.93
Interval in sidereal time from mean noon - - - - -	2	22	20.11
Retardation of mean on sidereal time for the interval - - - - -		—	23.32
Mean solar time required - - - - -	2	21	56.79

which is the interval elapsed since mean noon, expressed in mean time; and therefore the time which ought to be shown by a mean time clock.

*Vice versâ*, to convert  $2^h 21^m 56^s.79$  mean solar time, January 2, 1850, into sidereal time for the same meridian.

	h	m	s
Mean interval from mean noon, January 2 - - - - -	2	21	56.79
Acceleration of sidereal on mean time for the interval - - - - -		+	23.32
Sidereal interval from mean noon - - - - -	2	22	20.11
Sidereal time at mean noon, January 2 - - - - -	18	47	3.93
Sidereal time required - - - - -	21	9	24.04

which ought to be the time shown by the sidereal clock at the instant in question.

If the place of observation be not on the meridian of Greenwich, the sidereal time must be corrected by the addition of  $9^s.8565$  for each hour (and proportional parts for the minutes and seconds) of longitude, if the place be to the west of Greenwich; but by its subtraction, if to the east. Thus in  $9^h 10^m 6^s$  west longitude, the sidereal time at mean noon, January 2, instead of being, as in the foregoing Example,  $18^h 47^m 3^s.93$ , must be corrected by adding  $1^m 30^s.37$ , thus giving  $18^h 48^m 34^s.30$  for the time to be used, instead of that set down in the column.

The conversion of mean solar to sidereal time, and *vice versâ*, may, however, be performed, and with perhaps less liability to error, by means of this and of the column entitled *Mean Time of Transit of the First point of Aries*, at page XXII. of each month, using the Tables of Time Equivalents, inserted at pages 584 to 587.

To convert mean solar into sidereal time: To the sidereal time at the *preceding* mean noon add the sidereal interval corresponding to the given mean time; the sum will be the sidereal time required. (See Example at page 585.)

To convert sidereal into mean solar time: To the mean time at the *preceding* sidereal noon, add the mean interval corresponding to the given sidereal time; the sum will be the mean solar time required. (See Example at page 587.)

In this mode of reduction there is not, as in the former, by means of the Tables of Acceleration and Retardation, any distinction of cases, all the quantities being additive.

The Tables of Time Equivalents differ from the Tables of Acceleration and Retardation, in containing the values of intervals of each species of time, expressed in



terms of the other, instead of the *corrections*, respecting the proper application of which, a difficulty is sometimes felt by unpractised computers.

Sidereal time at mean noon is also used in finding the mean time of transit of a heavenly body.

Page III. of each Month.

The *Sun's Longitude*, here given, is affected with aberration, and reckoned from the *true* equinox: it is therefore the *apparent* longitude of the Sun at the instant of mean noon; or it is (if  $\rho$  denote the Radius Vector) the *true* Longitude of the Sun at the time  $0^h - 497^m 235^s \rho$ , because aberration causes the Sun to appear behind its true place in the Ecliptic.

The *Sun's Latitude* is the angular distance of the Sun's centre from the plane of the Ecliptic, measured on a circle perpendicular to that plane.

The *Logarithm of the Radius Vector of the Earth* is the logarithm of the distance between the centre of the Earth and the *apparent* place of the centre of the Sun at mean noon, the mean distance, or the semi-axis major of the orbit, being considered unity.

These quantities are derived *immediately* from the Solar tables, and enter into, indeed are the foundation of, nearly all the subsequent operations in the Ephemeris. Whenever the *true* longitude of the Earth is required, as in calculating the Geocentric position of a Planet or Comet from its Heliocentric position, it is necessary to reduce the *apparent* longitude of the Sun to the *true*, by correcting it for aberration. The Sun's aberration for every tenth day is given at page 266, and may thence be readily obtained for any other day of the year. (See *Sun's Aberration*, page 611.) In strictness, the *Logarithm of the Radius Vector* should also be corrected for aberration, but this is generally neglected, the correction being too small to affect the accuracy of the results in practice.

The Sun's longitude, entering into the expressions for aberration and Solar nutation, is required for the reduction of the Stars' places.

The *Moon's Semidiameter* is the angle under which her Semidiameter would appear if viewed from the centre of the Earth; and her *Horizontal Parallax* is the *greatest* angle under which the Earth's Equatorial Semidiameter would appear if seen from the centre of the Moon. The former is requisite to obtain the position of the centre from an observation of the Moon's *limb*, as in all cases of altitudes or lunar distances. The latter, for computing the horizontal parallax of the Moon at any given latitude on the Earth, *considered as a Spheroid*; also for finding the parallax in altitude, Right Ascension, &c., for the purpose of reducing an observation of the Moon made on the surface of the Earth, to what it would be if made at the centre.

In reducing observations of the Moon made at sea, the horizontal *equatorial* parallax is generally used for finding the parallax in altitude, without regarding the previous reduction to the Spheroid; but in calculations requiring considerable precision in lunar occultations and solar eclipses, this reduction is

*Example.* To find the Moon's Semidiameter at February 25, 1850, at a place  $15^\circ$ , or  $1^h$  to the  $^s$  at the place expressed in mean astronomical time subtracting  $1^h$ , because the place is to the east of  $G$  for the corresponding time at Greenwich, or  $5^h$  semidiameter given for midnight of the 24th, we of the variation in 12 hours due to the time elapsing for ordinary purposes at sea, it will suffice simply

augmented +

Paral

.

-

1

11

correction of the registered value preceding the given time; thus the semidiameter for midnight, or 12<sup>h</sup>, of the 24th, is 16' 29''·3, and for the 25th at noon, or 24<sup>h</sup>, it is 16' 27''·7; the difference 1''·6 is the variation in 12 hours. Therefore,

$$12^h : 1''\cdot6 :: 5^h : 0''\cdot7,$$

which, *subtracted* (because the quantities are decreasing) from 16' 29''·3, gives 16' 28''·6 for the Moon's Semidiameter at the time proposed. Similarly, the Horizontal Parallax at midnight of the 24th is 60' 30''·6; and at noon of the 25th it is 60' 24''·6; the difference 6''·0 is the variation in the 12 hours which include the given time; therefore, 12<sup>h</sup> : 6''·0 :: 5<sup>h</sup> : 2''·50, or 2''·5, which *subtracted* (because the quantities are decreasing) from 60' 30''·6 gives 60' 28''·1 for the Horizontal Parallax required. If greater accuracy be desired, a further correction must be applied to the values just obtained, on account of second differences, to compensate the error produced by supposing the first differences uniform. But the *greatest* error in the semidiameter which can arise by this supposition in the present instance is not one-tenth of a second; for, select four semidiameters from the Ephemeris, two preceding, and two following the given time, and take the first and second differences, thus:—

February 24,	<sup>h</sup> 0	<sup>'</sup> 16	<sup>''</sup> 30	<sup>'''</sup> 0	—	<sup>''</sup> 0·7	—	<sup>''</sup> 0·9
	12	16	29	·3	—	1·6	—	1·1
25,	0	16	27	·7	—	2·7	—	1·1
	12	16	25	·0				

The mean of the second differences is 1''·0, and  $\frac{1}{2}$  of this, which is the *greatest* effect, is only 0''·125.

A similar operation performed on the Parallaxes will show the error that would arise on the supposition of uniform or equal first differences, to be five-tenths of a second.

#### Page IV. of each Month.

The *Moon's Longitude and Latitude* at Mean Noon and Midnight indicate the position of the Moon at these respective times, referred to the Ecliptic and the true Equinox, as it would be seen from the centre of the earth. They are the results deduced immediately from the Lunar Tables, and are the foundation of all subsequent calculations in which the Moon is concerned. These quantities are now of little use to the seaman, as the position of the Moon, with respect to the Equator, is given for every hour in the succeeding pages; but the Moon's Longitude is involved in the formulæ for nutation, and is therefore necessary for its determination. In finding the Moon's Longitude and Latitude for any other times than those of Mean Noon and Midnight, it is necessary to apply the equation of second, and sometimes even of third and fourth differences, on account of the irregular variation of her motion.

The *Moon's Age* at Mean Noon is the Mean Time elapsed since the Moon's ecliptic conjunction with the Sun, or since the Sun and Moon had the same Longitude. The numbers in this column represent her age at Greenwich, and are expressed in days, and decimal parts of a day.

The *Moon's Meridian Passage*.—This column contains the Greenwich Mean Time, to the nearest tenth of a minute, at which the Moon's centre is on the *upper Meridian*



of Greenwich, and is useful to indicate when the Latitude may be obtained from an observed meridian altitude of the Moon; also, in conjunction with a Table of Semi-diurnal Arcs, to determine approximately the times of the rising and setting of the Moon: it is likewise useful in finding the time of High Water.

When the symbol ( $\odot$ ) denoting conjunction occurs, as on January 12, we are to understand that the Moon does *not* pass the *upper* meridian on that day at Greenwich. This is the case once in every lunation, and arises from the circumstance of the Lunar day being greater than the Mean Solar day, and including it within its limits. In the present instance, the excess is  $0^h 47^m \cdot 7$ , or the lunar day is equal to  $24^h 47^m \cdot 7$  Mean Solar time; the Moon passes the meridian on the 11th at  $23^h 21^m \cdot 0$ , or  $39^m \cdot 0$  *previously* to the noon of the 12th, and does not return to the same meridian until  $0^h 8^m \cdot 7$  *after* the noon of the 13th. For the same reason there is also one day in every lunation on which the Moon does not transit the *lower* meridian, and this happens about the time of opposition, or when the difference of longitude of the Sun and Moon is  $180^\circ$ . In the list of Moon-culminating Stars, at pages 504 to 546, the days on which only one transit occurs are readily seen. On January 12th (page 505), for instance, it appears that the Moon transits the *lower* meridian only, while on January 27th (page 507), the only transit is that at the *upper* meridian.

To find the Mean Time of Transit under any other Meridian, suppose  $45^\circ$  or  $3^h$  west of Greenwich, on January 15, 1850. The Meridian being to the west of Greenwich, the Transit will take place *after* the Greenwich time of Transit on the 15th; therefore take the difference between the Meridian Passages on the 15th and 16th, which is  $0^h 45^m \cdot 7$ . Then,  $24^h : 0^h 45^m \cdot 7 :: 3^h : 5^m \cdot 7$ , which *added* to the Greenwich Mean Time of Transit gives  $1^h 48^m \cdot 0$  for the Mean Time of Transit at the given Meridian. Had the assumed Meridian been  $3^h$  to the east of Greenwich, the Transit would have taken place *before* the Transit at Greenwich, and the proportional part of the difference between the 14th and 15th, must in this case have been *subtracted*. The times thus deduced are only approximate; but they are sufficiently accurate for the purposes usually required.

#### Pages V. to XII. of each Month.

The *Moon's Right Ascension and Declination* for every hour of the day, with the *Difference of Declination for 10 minutes*. By means of the quantities here given, the Latitude, Time, Azimuth, Moon's rising and setting, &c., may be deduced, with nearly as little labour as is required in the case of the Sun. The numbers represent the position of the Moon, as it would appear from the centre of the Earth, with respect to the Equator and the true Equinox: and they are given for every hour, with the view of rendering any correction for second differences unnecessary, except where extreme precision is required. The Right Ascension for any time is readily obtained by simply adding the proportional part of the hourly variation due to the interval elapsed since the preceding hour. Thus, suppose the Right Ascension of the Moon were required at  $8^h 45^m$  mean time of January 8, in longitude  $60^\circ$ , or  $4^h$  east of Greenwich. The given time,  $8^h 45^m$ , diminished by  $4^h$ , gives the corresponding Greenwich time  $4^h 45^m$ . The Right Ascension at  $4^h$  is  $15^h 39^m 12^s \cdot 80$ , and at  $5^h$  it is  $15^h 41^m 13^s \cdot 51$ ; the difference,  $2^m 0^s \cdot 71$ , is the increase in the interval, or  $60^m$ . Hence,  $60^m : 2^m 0^s \cdot 71 :: 45^m : 1^m 30^s \cdot 53$ , which being added to the Right Ascension at  $4^h$ , gives  $15^h 40^m 43^s \cdot 33$  for the Right Ascension at  $4^h 45^m$  at Greenwich, and  $15^m$  under the proposed meridian. To find the Declination, we make use of the numbers in the column headed "Diff. Dec. for 10". The number in this column being



opposite to any hour is  $\frac{1}{2}$  of the difference of the Declinations at that and the following hour. We therefore say,  $10^m : 69''\cdot65 :: 45^m : 5'13''\cdot43$ , which being added (because the Declinations are increasing) to S.  $14^\circ 12' 5''\cdot1$ , the Declination at 4<sup>h</sup>, gives S.  $14^\circ 17' 18''\cdot5$ , for the Declination at the time proposed.

The *Phases of the Moon*. These are given at page XII. to the nearest tenth of a minute. The numbers denote the Greenwich Mean Time, at which the difference of Longitude between the Sun and the Moon is  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$ , or  $270^\circ$ , being

$0^\circ$  at the New Moon,  
 $90^\circ$  at the First Quarter,  
 $180^\circ$  at the Full Moon,  
 $270^\circ$  at the Last Quarter.

The Moon's *Apogee and Perigee*. The numbers here given indicate, to the nearest hour, the Greenwich Mean Time at which the Moon is respectively at her greatest and least distance from the Earth.

Pages XIII. to XVIII. of each Month.

*Lunar Distances*.—These pages contain, for every third hour of Greenwich Mean Time, the angular distances between the apparent *centres* of the Moon and certain heavenly bodies, such as they would appear to an observer at the centre of the Earth. When a Lunar Distance has been observed on the surface of the Earth, and reduced to the centre, by clearing it of the effects of parallax and refraction, the numbers in these pages enable us to ascertain the exact Greenwich mean time at which the objects would have the same distance. They are arranged, from *west* to *east*, commencing each day with the object which is at the greatest distance *westward* of the Moon, in the precise order in which they appear in the heavens; W. indicating that the object is west, and E. east of the Moon. Thus we have at one view, by a simple reference to the date, all the lunar distances which are available for the determination of the Longitude.

The columns headed "P. L. of Diff." contain the Proportional Logarithms of the Differences of the distances at intervals of three hours, which are used in finding the Greenwich time corresponding to a given distance, according to the following rule, viz.: For the given day, seek in the Ephemeris for the *nearest* distance *preceding*, in order of time, the given distance, and take the difference between it and the given distance; from the proportional logarithm of this difference subtract the proportional logarithm standing opposite to the said *nearest* distance in the Ephemeris; the remainder will be the proportional logarithm of a portion of time to be added to the hour answering to the *nearest* distance, to obtain the approximate Greenwich mean time corresponding to the given distance.

If the distance between the Moon and a Star increased or decreased uniformly, the Greenwich time corresponding to a given distance, as found by the above rule, would be strictly correct; but an inspection of the columns of the Proportional Logarithms in the Ephemeris will show that this is not the case; and as the knowledge of the exact Greenwich time is desirable, a correction must be applied to the time so found for the variation of the differences of the distances. This correction may be obtained by means of the Table at page 580 of the present volume, in the following manner:

1. Find the Approximate interval by the preceding rule.
2. Take the difference between the proportional logarithms standing opposite to the *distances* in the Ephemeris which include the given distance.



3. With the approximate interval and this difference, as arguments, take out the correction from the table.

4. If the Proportional Logarithms are *decreasing*, add the correction to the approximate time; but if *increasing*, subtract it: the result will be the accurate Greenwich mean time.

*Example I.*—Suppose it were required to find the Greenwich Mean Time, at which the *reduced* distance between the Moon and  $\alpha$  Pegasi would be  $66^{\circ} 18' 0''$  on January 22, 1850. It appears, by inspecting the distances, that the time must be between *Midnight* and *XV<sup>h</sup>*: the *nearest* distance *preceding*, in order of time, the given distance is therefore the

Distance at <i>Midnight</i>	$65^{\circ} 26' 40''$	and P. L.	- - 2713
<i>Reduced</i> Distance	- $66 15 0$		
Difference	- $0 48 20$	- P. L.	- - 5710
Approximate Interval	$1^h 30^m 17^s$	- P. L.	- - 2997

The difference between the Proportional Logarithms in the Ephemeris, at *Midnight* and *XV<sup>h</sup>*, is 26. Opposite to  $1^h 30^m 17^s$  (or the quantity nearest to it,  $1^h 30^m$ ), and under 26, in the Table, we have for the correction  $8^s$ , which, added to the Approximate Interval,  $1^h 30^m 17^s$ , because the Proportional Logarithms are *decreasing*, gives  $1^h 30^m 25^s$ , for the true interval from *Midnight*: and hence the Greenwich Mean Time is  $13^h 30^m 25^s$ .

We see that, in the preceding Example, the omission of this correction would only produce an error of  $2'$  in the Longitude. Cases may however occur, in which it would be greater.

It will sometimes happen, that the difference of the Proportional Logarithms will exceed 138, the limit of the Table of Correction; in this case the Table may be entered with the Approximate Interval, and *one-half* or *any fraction* of the difference of the Proportional Logarithms and the corresponding correction *increased in like proportion*.

*Example II.*—Suppose it were required to find the Greenwich Mean Time, at which the *reduced* distance between the Moon and Pollux would be  $18^{\circ} 25' 57''$  on February 21st, 1850. By inspecting the distances, it appears that the time must be between *XVIII<sup>h</sup>* and *XXI<sup>h</sup>*; therefore take the

Distance at <i>XVIII<sup>h</sup></i>	$19^{\circ} 13' 40''$	and P. L.	- - 2873
<i>Reduced</i> Distance	- $18 25 57$		
Difference	- $0 47 43$	- P. L.	- - 5766
Approximate Interval	$1^h 32^m 28^s$	- P. L.	- - 2893

The difference between the Proportional Logarithms in the Ephemeris, at *XVIII<sup>h</sup>* and *XXI<sup>h</sup>*, is 144, one-half of which is 72; under this number in the opposite that nearest the Approximate Interval, is  $23^s$ : the correction  $46^s$  to be *subtracted* from the Approximate Interval, because the Logarithms are *increasing*; the time at Greenwich is therefore  $19^h 1$

The omission of the correction in the preceding example would produce an error of  $11\frac{1}{4}'$  in Longitude; it may, however, be considered as an extreme case, and such as will seldom be met with.

The proportional logarithms also serve to point out the Star which is most favourably circumstanced for accurate observation; that Star being to be preferred which has the least Proportional Logarithm opposite to it: for, the greater the velocity of the Moon from or towards a Star, the greater is the reliance to be placed on an observation of the distance; and it is a property of Proportional Logarithms to decrease as their natural numbers increase: a smaller Proportional Logarithm, therefore, indicates a greater velocity of the Moon, or a greater variation of distance in the interval, upon which the value of the observation depends. Thus, on June 18, 1850, between *Noon* and III<sup>h</sup>, Regulus is the most eligible star, because the Proportional Logarithm, 2615, is less than that of any other; and, by inspecting the columns of Proportional Logarithms, it will appear to deserve the preference until XXI<sup>h</sup> on the 20th.

On the 30th day of April, between IX<sup>h</sup> and *Midnight*, the following is the order of preference, as indicated by the Proportional Logarithms, viz., Jupiter, Spica  $\pi$ , Saturn, Antares,  $\alpha$  Pegasi, Fomalhaut, SUN.

It is by no means to be inferred from these remarks that observations of any of the distances are to be neglected; on the contrary, every registered star should invariably be observed when an opportunity offers. If, however, on a comparison of results, a considerable difference should be discovered, the Proportional Logarithms will indicate the stars which are least liable to be affected by errors of observation, and therefore deserving of a greater degree of confidence as to the accuracy of the results obtained from them.

Page XIX. of each Month.

#### *Configurations of the Satellites of Jupiter.*

In addition to the explanation given at the foot of the page, it may be remarked, that when two Satellites are in or near conjunction, instead of the usual symbol ( $\delta$ ), it has been thought better to place one above the other, without regard to their actual latitudes, but merely to distinguish them in their relation of *upper* and *lower*.

The Satellites are in the superior parts of their orbits, or have Jupiter between them and the Earth, when they are moving from West to East, or towards the right-hand of the page; but they are in the inferior parts of their orbits, or between the Earth and Jupiter, when they are moving from East to West, or towards the left-hand: in the former case Eclipses and Occultations occur, and in the latter Transits of the Satellites and their Shadows.

If an inverting telescope be directed towards Jupiter on June 15, 1850, at 8<sup>h</sup> 30<sup>m</sup> Mean Time, the Satellites will appear to an observer at Greenwich in the positions as laid down in the Table. The 1st and 2nd Satellites, which are *really* to the left of the Planet, will appear to the right of it; and the 3rd and 4th, which are *really* to the right, will appear to be to the left.

*West* and *East*, at the head of the page, are inserted to show the positions of the Satellites with respect to Jupiter, as they would appear in a telescope that does not invert. Jupiter being always to the South of the zenith of Greenwich, the Satellites which are here laid down on the left of Jupiter would appear to the *West*, and those on the right-hand to the *East* of the planet.



As regards their positions to the east or west, the page viewed directly, exhibits the Satellites in an inverted order; but if the leaf be turned over, and the page viewed from the other side, they will appear in their real positions. The simplest mode of changing the position of a Satellite from apparent to real, and *vice versa*, is to draw a line from the Satellite through Jupiter's centre, and to place the Satellite upon this line at the same distance from the centre as before, only on the opposite side. If this operation be performed upon the Configurations as laid down in this volume, the Satellites will be reduced to their real position.

As the Configurations are given for *Mean Astronomical time*, which agrees with *Civil time* only from 0<sup>h</sup> to 12<sup>h</sup>, or from noon to midnight, when the time exceeds 12<sup>h</sup> the excess will indicate the Civil time of the succeeding day of the month.

Thus in October, 1850, the Configurations are given for 17<sup>h</sup> 30<sup>m</sup> mean time, but the 17th hour from noon is the same as the 5th hour from the following midnight, when a new Civil day has commenced. The appearances, therefore, relate to 5<sup>h</sup> 30<sup>m</sup> A.M. of the day following, according to the common mode of reckoning time; that is, the Configurations at 17<sup>h</sup> 30<sup>m</sup> on October the 26th relate to 5<sup>h</sup> 30<sup>m</sup> A.M. on October the 27th.

The Configurations enable an observer to distinguish the Satellites from each other, and from Stars in the vicinity of Jupiter.

#### Page XX. of each Month.

#### *Eclipses of the Satellites of Jupiter.*

On this page are given the Mean and Sidereal Times of the Eclipses of the Satellites, together with diagrams exhibiting the position of each Satellite with respect to the disc of the Planet at the moment of Immersion or Emersion, as it will appear in an inverting telescope. These diagrams have been laid down from calculations made for the eclipse nearest to the middle of each month; but they will serve very well for the whole of the month, *except near opposition*, the change in the position of Jupiter and his Shadow in the interval being too small to be appreciable by the eye, as is evident by comparing the Phases for any two successive months. All the Eclipses which happen when Jupiter is 8° above and the Sun 8° below the horizon of Greenwich, are marked with an asterisk to indicate that they are visible at that place; and those which happen when Jupiter is above, and the Sun below the horizon, are marked with a dagger, as, under very favourable circumstances, they may also be observed.

The Immersion (Im.) denotes the instant of the disappearance of the Satellite, by entering into the shadow of Jupiter; and the Emersion (Em.) the instant of its re-appearance at coming out of the shadow. They generally happen when the Satellite is apparently at some distance from the body of Jupiter, except near the opposition of Jupiter to the Sun, when the eclipse takes place near to the body of the planet. Before the opposition, the Immersions and Emersions happen on the Western side, but after opposition on the Eastern side, of the planet: With an inverting telescope, however, the appearances will be directly the contrary. Before the opposition, the Immersions only of the first Satellite are visible; and after the opposition, the Emersions only. It is seldom, also, that the Immersion and Emersion of the second Satellite can be observed at the same eclipse; but both phenomena are generally visible with the third and fourth Satellites.

To find the time at which the Immersion or Emersion of any of the Satellites will take place under any other meridian than that of Greenwich, it is merely necessary to



add the difference of longitude (*in time*) to the time of the phenomenon at Greenwich, if the meridian be *east* of Greenwich, or to *subtract* if it be *west*, and the sum or difference will be the time required. But this determines only the instant of the occurrence of the phenomenon: Jupiter may be below the horizon at this time, or he may be above it, and the intensity of sun-light, or even the brightness of twilight, may be such as to render the Satellites invisible: it is therefore necessary to ascertain the position of the Sun and Jupiter, with respect to the horizon, at the time of the phenomenon: this may be readily accomplished by means of a celestial globe, or near enough for the purpose, by finding the times of rising and setting of the objects, with the assistance of a table of semidiurnal arcs.

The Eclipses of Jupiter's Satellites, especially of the first, afford us, perhaps, the readiest means of determining the longitude; all that is necessary to be known being the exact time of observation: the difference between this time and the time at Greenwich, shows the difference of longitude at once, and it is *east* or *west* of Greenwich according as the time of observation is *greater* or *less* than the Greenwich time.

Suppose the Emersion of Jupiter's first Satellite to be observed, on August 8, 1850, at Paris at  $14^h 30^m 17.3$  Mean Time at that place; by reference to page XX., it appears that the Emersion will take place at Greenwich at  $14^h 20^m 55.8$  Greenwich Mean Time; the difference,  $9^m 21.5$ , is the difference of longitude between Greenwich and Paris; and because the Paris time is greater than that at Greenwich, we infer that Paris is to the east of Greenwich.

Independent of defects in the tables, there are difficulties attending the observation of these phenomena which unfit them for *accurate* determinations of longitude. Different telescopes give different results; and care should be taken to have recourse to those corresponding observations which have been made under circumstances the most similar, and particularly with telescopes of the same quality and power. When extreme accuracy is not required, the Eclipses of the Satellites will always afford a good approximation towards the difference of meridians, and observations of them should on no account be neglected, especially when the Immersion and Emersion of the same Satellite are both visible.

#### Page XXI. of each Month.

##### *Approximate Sidereal Times of the Occultations of Jupiter's Satellites by Jupiter, and of the Transit of the Satellites and their Shadows over the Disc of the Planet.*

These phenomena are inserted in order to apprise Astronomers when they are about to happen, as observations of them may tend to improve the Tables of the Satellites. The instruments required to observe them with anything like precision will preclude the possibility of their ever becoming available at sea. The times are given in days, hours, and minutes; the day being supposed to commence at mean noon, and the hours and minutes representing sidereal time, such as will be shown by a sidereal clock on that day.

The Phenomena for each Satellite are arranged under three distinct heads, and each in the order of the days of the month, so that an inspection of the columns opposite to each Satellite is necessary to determine what phenomena will happen on a given day.

An asterisk annexed to the day of the month, signifies that the phenomenon is visible at Greenwich, and a dagger, that the phenomenon *may* be visible under favourable circumstances, the limits in either case being the same as those adopted for the eclipses.



In the month of April, 1850, under the general heading "Occultations," opposite to Satellite I., and under Immersion, the first quantity recorded is  $1^h 7^m 21^s$ , which signifies that at  $7^h 21^m$  sidereal time on April the 1st an Immersion of the 1st Satellite takes place, and that it may be visible at Greenwich. Under Emersion we find, for the whole of the month, "In the shadow," which signifies that the Emersion of the Satellite cannot be seen, because, although it ceases to be occulted by the body of the Planet, it is still involved in its shadow, from which it does not indeed escape until  $10^h 9^m 8^s.5$  sidereal time on the 1st. (See Eclipses of the Satellites of Jupiter on the preceding page of the month.) Again, in the column of Occultations opposite to Satellite III., it appears that the 3rd Satellite is occulted on the 20th day of the month; that it disappears behind the disc of the Planet at  $20^h 46^m$ , and reappears at  $0^h 9^m$ , Sidereal time; but that both Immersion and Emersion are invisible at Greenwich.

In the column headed "Transits of Satellites," the first transit of Satellite II. at Greenwich appears to be on the 3rd day, when the ingress takes place at  $0^h 48^m$ , and the egress at  $3^h 36^m$ , Sidereal time; that is, it comes in contact with Jupiter's disc at  $0^h 48^m$ , remains on the disc  $2^h 48^m$ , and quits it again at  $3^h 36^m$ , sidereal time; both ingress and egress are invisible at Greenwich.

The Transits of Shadows are to be interpreted in a similar manner.

#### Page XXII. of each Month.

##### 1. *Logarithms of A, B, C, D, for correcting the Places of the Fixed Stars.*

In the formulæ which express the relation of the apparent place of a Star to its mean place, and reciprocally, there are certain factors which are independent altogether of the Star's place, and are therefore common to all Stars. These factors depend upon the longitudes of the Sun, Moon, and Moon's ascending Node.

The Logarithms here given are the logarithms of these independent factors, conveniently arranged for incorporation with other terms depending upon each particular Star, according to the method recommended by the late Professor Bessel. They have been computed for Mean Midnight at Greenwich, according to the formulæ exhibited at page 459, omitting in C and D the terms depending on  $2^{\circ}$ .

In the form under which they now appear, they are chiefly used in conjunction with the Catalogue of the British Association,\* which contains the Logarithms of the remaining factors depending on the Star's place; and for the reduction of any Star in that Catalogue, they appear to afford every facility that can be desired.

Where, however, the apparent place of any Star, *not in the British Association Catalogue*, is required, similar quantities to those must either be computed with reference to the particular Star, before we can use the A, B, C, D, or recourse must be had to other and independent means; such, for instance, as are afforded by the Table at pages 460 and 461, which serves equally for all Stars. The manner by which this Table has been constructed are given at page 459.

The following Examples will sufficiently illustrate the method.

\* "The Catalogue of Stars of the British Association for the Advancement of Astronomical Science, containing the Mean Right Ascensions and North Polar Distances of eight thousand Fixed Stars, reduced to January 1, 1850: together with their annual proper motions, as well as the logarithmic constants for computing their places. With a Preface explanatory of their Construction and Application. London, 1845. 4to.

## EXPLANATION.

Required the Correction ( $\Delta \alpha$ ) of the Right Ascension and ( $\Delta \delta$ ) of the Declination of  $\gamma$  Orionis (No. 1687 B.A.C.) for Precession, Aberration, and Nutation, at Greenwich Mean Midnight, on February 5, 1850.

1.—By the B.A.C. Constants and the Logarithms of A, B, C, D.

Mean $\alpha$ , Jan. 1, 1850				Mean $\delta$			
h m s 5 17 5.33				° ' " + 6 12 34.3			
		Logarithms.	Nat. Nos.			Logarithms.	Nat. Nos.
$a$		8.0963		$a'$		9.3120	
A		1.1360		A		1.1360	
$aA$		9.2323	0.171	$a'A$		0.6480	4.446
$b$		8.8188		$b'$		8.3839	
B		1.1447		B		1.1447	
$bB$		9.9635	0.919	$b'B$		9.4486	0.281
$c$		0.5070		$c'$		0.5721	
C		8.9160		C		8.9160	
$cC$		9.4230	0.265	$c'C$		9.4691	0.208
$d$		7.1304		$d'$		9.9923	
D		0.8752		D		0.8752	
$dD$		8.0056	0.010	$d'D$		0.8675	7.371
		$\Delta \alpha = +$	0.493			$\Delta \delta = -$	11.844

2.—By the independent Constants.

For February 5, 1850, the Table at pages 460, 461, furnishes

$$f = -3.80; g = +7.68; G = 102.25; h = +19.48; H = 315.34; i = -5.92$$

$$\alpha \text{ (in time) converted} = 79.16$$

$$G + \alpha = 181.41$$

$$H + \alpha = 34.50$$

		Logarithms.	Nat. Nos.			Logarithms.	Nat. Nos.
$f$			3.80				
$g$		0.8854				0.8654	
$\sin(G + \alpha)$		8.4680		$\cos$		9.9998	
$\tan \delta$		9.0367				0.8852	7.68
		8.3901	0.02				
$h$		1.2896				1.2696	
$\sin(H + \alpha)$		9.7568		$\cos$		9.9143	
$\sec \delta$		0.0026		$\sin$		9.0341	
		1.0490	11.19			0.2380	1.73
		$\Delta \alpha \text{ (in arc)} = +$	7.37				
		$\Delta \alpha \text{ (in time)} = +$	0.491	$i$		0.7723	
				$\cos \delta$		9.9974	
						0.7697	5.89
						$\Delta \delta = -$	11.83

$$\text{Hence the App. Right Ascens. of } \gamma \text{ Orionis} = 5^{\text{h}} 17^{\text{m}} 5.33^{\text{s}} + 0.49 = 5^{\text{h}} 17^{\text{m}} 5.82^{\text{s}}$$

$$\text{And the Apparent Declination} = + 6^{\circ} 12' 31.3'' - 11.8 = + 6^{\circ} 12' 22.5''$$



2. *Mean Time of Transit of the First Point of Aries.*

The time in this column shows the distance of the *mean* Sun from the meridian, at the instant when the *true* point of intersection of the ecliptic and equator (called the first point of Aries) is on the meridian of Greenwich; and as the distance of the first point of Aries from the meridian, at the instant the mean Sun is on the meridian, is denominated Sidereal Time at Mean Noon, this may, by analogy, be termed the *Mean Time at Sidereal Noon*. It is the time which ought to be shown by a mean time clock adjusted to the Greenwich meridian, at the moment that a clock, adjusted to sidereal time, indicates exactly  $0^h 0^m 0^s$ . The use of this column is to facilitate the reduction of sidereal to mean solar time, with the help of the Table of Time Equivalents, given at pages 586 and 587, of this volume, as has been already explained at page 598.

3. *Mean Equinoctial Time.*

Mean Equinoctial Time signifies the Mean Time elapsed since the instant of the Mean Vernal Equinox. The numbers in this column represent this time, at every Mean Noon, in Mean Solar days and fractional parts of a day; it is reckoned from the Mean Vernal Equinox of 1849, between January 1<sup>d</sup> and March 22<sup>d</sup>·370427, but after March 22<sup>d</sup>·370427 from the Vernal Equinox of 1850; for the Equinoctial Year has been assumed, according to Bessel, (*Conn. des Temps*, 1831, Additions, page 154) equal to 365·242217 Mean Solar days; and as the Equinoctial Time corresponding to the Mean Noon of March 22, 1850, is 364<sup>d</sup>·871790, it is evident that the Equinoctial Year of 1849-50 was completed, and that a new year commenced, at 0<sup>d</sup>·370427 after Mean Noon of the 22nd.

The fraction of the day at the head of the column is common to all the days of the Equinoctial Year. Thus, at Mean Noon of January 19, 1850, the Equinoctial Time is 302<sup>d</sup>·871790, and on January 20 it is 303<sup>d</sup>·871790, and so on until March 22<sup>d</sup>·370427, when the year terminates, and the fractional part of the day changes. At Mean Noon of March 23, 1850, the Equinoctial Time is 0<sup>d</sup>·629573, and this fraction is to be annexed to all the numbers in the column of days, from the period of the change until the equinox of 1851.

At the instant the Mean Sun arrives at the Mean Vernal Equinox, it must also be on *some* meridian, and this meridian will then have its equinoctial time corresponding with its Mean Solar time, each of which will be  $0^h 0^m 0^s$ , and they will continue to correspond throughout the Equinoctial Year. At the end of the Equinoctial Year, the Sun will have passed this meridian 365 times, and have performed, besides, a certain portion of its 366th diurnal revolution, viz. 0<sup>d</sup>·242217; it will, therefore, have arrived at some other meridian, which will now, in its turn, reckon the Mean Equinoctial and Mean Solar time from the same point, and remain constant for the year. Thus the meridian, from which the time is reckoned, is shifting its position at the end of every year by 0<sup>d</sup>·242217, or 5<sup>h</sup> 48<sup>m</sup> 47<sup>s</sup>·55, to the Westward. Between the Vernal Equinoxes of 1849 and 1850, this itinerant meridian corresponds to Longitude 0<sup>d</sup>·629573 East, or 8<sup>h</sup> 53<sup>m</sup> 24<sup>s</sup>·89 West of Greenwich.

This species of time was first introduced in the Supplement to the Nautical Almanac for 1828, with a very full explanation of its nature and use. It there appears, that the use of Equinoctial Time is to afford an uniform date, which shall be independent of the different meridians, and of all inequalities in the Sun's motion, and shall thus save the necessity, when speaking of the time of any event's happening, of mentioning at the same time the place where it was observed or computed. Thus, it is interesting to say that a comet passed its perihelion on January 5, 1850, at 5<sup>h</sup>



Mean Time at Greenwich; at  $5^h 56^m 21^s.5$ , Mean Time at Paris; or at  $1849^y 289^d 2^h 42^m 22^s.66$  Equinoctial Time; but the former dates make the localities of Greenwich and Paris enter as elements of the expression; whereas the latter expresses the period elapsed since an epoch common to all the world, and identifiable independently of all localities. By this means all ambiguities in the reckoning of time are supposed to be avoided.

To convert Mean Solar into Equinoctial Time: To the corresponding Greenwich Mean Time add the Equinoctial Time at Mean Noon of the same day at Greenwich: the sum will be the Equinoctial Time required. Thus, in the instance of the comet before alluded to, Paris being  $9^m 21^s.5$  East of Greenwich, subtract this from the Paris time and we get  $5^h 47^m 0^s.0$  for the corresponding Greenwich Time, to which add  $288^d 871790$ , or  $288^d 20^h 55^m 22^s.66$ , the Mean Equinoctial Time at Greenwich Mean Noon of January 5, and the sum will represent the Mean Equinoctial Time of the Comet's passage of its perihelion, viz.  $289^d 2^h 42^m 22^s.66$ , from the vernal equinox of the year 1849.

#### 4. Day of the Year.

The numbers in this column indicate the complete days at mean noon which have elapsed since mean noon of January 1. Mean noon of January 1 is therefore reckoned 0, and 1 is found opposite to that of January 2, because at that instant one entire day has elapsed.

#### 5. Fraction of the Year.

These fractions are the quotients found by dividing the numbers in the preceding column by 365.25. The day and fraction of the year are useful in many Astronomical calculations.

#### *Obliquity of the Ecliptic.* (Page 266.)

The apparent inclination of the plane of the Ecliptic to that of the Equator is here given for every 10th day of the year, and continued to January 6 of the following year, marked December 37 for the sake of convenience. This inclination is ever varying, as well from the effect of its mean diminution, as of the nutation of the earth's axis: it is an important element in deducing the positions of the heavenly bodies, with reference to either of the planes, when we know their positions with respect to the other; as, for instance, in computing Right Ascensions and Declinations from Longitudes and Latitudes, and *vice versa*. If the apparent Obliquity be required for any date not to be found in the Table, it may be obtained by simply taking the proportional part of the variation of the obliquity corresponding to the interval which comprises the given date. Thus, the apparent Obliquity on October 31, 1850, is  $23^{\circ} 27' 25''.76$ . For the variation of the Obliquity in the ten days between October the 28th and November the 7th, is  $0''.13$  or  $0''.013$  for one day, and this being multiplied by 3, the number of days between the 28th and the 31st, gives  $0''.04$ , to be subtracted from the Obliquity of October the 28th. For most purposes, however, the Obliquity corresponding to the date in the Table nearest to the given date is sufficient, as is evident from an inspection of the quantities.

#### *Sun's Horizontal Parallax.* (Page 266.)

The Sun's Horizontal Parallax is the *greatest* angle under which the equatorial semidiameter of the earth would appear at the Sun's centre. It varies inversely as the distance, and the numbers in this column show the values for every tenth day of the year.



The Parallax serves for reducing a Solar observation made at the surface of the earth to what it would have been if made at the centre.

*Sun's Aberration.* (Page 266.)

The progressive motion of light, combined with the motion of the Earth in its orbit, makes the Sun to appear in a different position from that which he really occupies, the true position being always in advance of the apparent. The numbers in this column indicate, for every 10th day of the year, the amount of Aberration, or the quantity to be applied to the *true* longitude of the Sun to obtain the *apparent* longitude. The longitudes derived from the Solar Tables include Aberration, and are therefore *apparent* longitudes, such as are contained in this Ephemeris. If the *true* longitude of the Sun be wanted, as is the case in finding the longitude of the Earth for the calculation of the Geocentric place of a body, the aberration must be applied with a contrary sign. Thus, on June 10, 1850, at Mean Noon, by adding  $20''.11$ , the amount of aberration, to  $79^{\circ} 10' 53''.2$ , the apparent longitude of the Sun, we obtain  $79^{\circ} 11' 13''.31$  for the true longitude.

*Equation of the Equinoxes.* (Page 266.)

The Solar and Planetary Tables furnish us with the places of the Heavenly Bodies referred to the Mean Equinox; but the true place of the Equinox at any time differs from its mean place, by a quantity which is termed the Equation of the Equinoxes; and the numbers here given show the value of the Equation for every 10th day of the year. They are to be applied, with their proper signs, to the Longitudes reckoned from the Mean Equinox, to obtain the values with respect to the True Equinox.

If the Longitude of a body be given with reference to the true Equinox, as in this Ephemeris, and it be required to find its Longitude reckoned from the Mean Equinox, the Equation of the Equinoxes must be applied with a contrary sign. Thus, the longitude of the Sun, reckoned from the true Equinox, on July 20, 1850, at Mean Noon, is  $117^{\circ} 20' 21''.6$ , and the Equation of the Equinoxes is  $-11''.29$ ; therefore, applying it with the contrary sign, the sum  $117^{\circ} 20' 32''.89$  is the Sun's Longitude from the *Mean* Equinox on that day.

The Equation corresponding to any date not contained in the Table, may be obtained in the usual way by interpolation.

The Equation of the Equinoxes in Right Ascension, in a similar manner, enables us to find the *apparent* point of intersection of the Ecliptic on the Equator; and is necessary in computing Sidereal Time.

*Mean Longitude of  $\odot$ 's ascending Node.* (Page 266.)

This column contains the Mean Longitude of the Moon's ascending Node, at Mean Noon of every 10th day of the year reckoned from the Mean Equinox. The place for any intermediate day is easily found from the daily motion inserted at the foot of the column. The Longitude of the Node is necessary in the calculation of Nutation; it is also sometimes used to determine roughly the Stars which are likely to undergo occultation by the Moon.

*Sun's Co-ordinates.* (Pages 267 to 274.)

These pages contain for each Greenwich Mean Noon the Sun's Co-ordinates X, Y, Z; X being measured on the ecliptic, from the vernal Equinoctial point of the date; Y, on a line in the plane of the ecliptic, from the first point of Cancer; and Z, perpendicular to the plane of the ecliptic, towards the North.



*Ephemeris of the Planets.* (Pages 275 to 455.)

These pages contain the Geocentric and Heliocentric Places of the Planets, Mercury, Venus, Mars, Vesta, Juno, Pallas, Ceres, Jupiter, Saturn, and the Georgiana.

The Geocentric places are the places of the centres of the planets, as they would appear from the centre of the Earth; the Heliocentric, such as they would appear from the centre of the Sun.

The positions of the larger planets are given for Greenwich Mean Noon and the Time of Transit on every day of the year. But those of the minor Planets are given approximately at Noon of every fourth day, and accurately for three months, preceding and following their respective Oppositions, at Time of Transit on each day. The Geocentric Right Ascensions and Heliocentric Longitudes, are reckoned from the True Equinox. The Geocentric Right Ascensions and Declinations are *affected with aberration*, and are therefore *apparent* positions.

By means of the positions of Venus, Mars, Jupiter, and Saturn, and particularly of Venus and Jupiter, which are frequently visible when the Sun is above the horizon, the Latitude, Time, and Variation of the Compass, may be found with nearly as much facility and accuracy as by the Sun.

The column headed "Meridian Passage" shows the Mean Time of the Planet's Transit over the meridian of Greenwich, and serves to find the Mean Time of Transit over any other meridian. As in the instance of the Moon before noticed, there are some days on which the planets do not pass the meridian; these are indicated by two asterisks (\* \*). If we refer to page 282, we shall find that Mercury does not pass over the Greenwich meridian on April 17th, and for a similar reason, viz., that the planetary day is here longer than the mean solar day, and commences so near, but previously, to the noon of the 17th, viz.,  $1^m \cdot 7$ , as to want still  $2^m \cdot 1$  of its completion at the termination of the 17th day. The planetary day, therefore, includes the solar day of April 17th: it begins *before* the solar day and ends *after* it, and the planet cannot arrive at the meridian at any period of it.

Another phenomenon takes place in the case of the planets, which, however, does not occur with the Moon; it is that of two transits on the same day, which arises from the planetary day being sometimes *shorter* than the solar day, commencing *after* and terminating *before* the solar day, and thus falling entirely within it. This cannot be the case with the Moon, because the lunar day is always greater than the solar day. When two transits occur, the times of both are registered, as at page 286, June 9th, where it appears that Mercury passes the Greenwich meridian  $4^m \cdot 9$  after Mean Noon of the 9th, and again at  $23^h 58^m \cdot 7$  on the same day, or  $1^m \cdot 3$  before the arrival of the following Mean Noon.

The positions of the planets for any time not given in the Ephemeris, and under any other meridian than that of Greenwich, are to be found by interpolation in the usual way. *Example*: Required the Right Ascension and Declination of Venus at  $6^h$  Mean Time on July 15, 1850, in longitude  $30^\circ$  west of Greenwich; also the time of Venus' passage over this meridian on the same day. The difference of longitude  $2^\circ$  added (because it is west) to the given time, gives  $8^h$  for the corresponding Greenwich time.

1. *For the Right Ascension.* The Right Ascension on July 15 is  $9^h 57^m 35^s \cdot 64$ , and on July 16 it is  $10^h 2^m 9^s \cdot 29$ ; the difference,  $4^m 33^s \cdot 65$ , is the variation of the Right Ascension in 24 mean hours; therefore  $24^h : 4^m 33^s \cdot 65 :: 8^h : 1^m 31^s \cdot 22$ , the proportional part of the variation answering to  $8^h$ ; and this proportional part added (because the Right Ascensions are increasing) to  $9^h 57^m 35^s \cdot 64$ , the Right Ascension at mean noon on July 15, gives  $9^h 59^m 6^s \cdot 86$  for the Right Ascension required.



2. *For the Declination.* The Declination on July 15 is N.  $14^{\circ} 8' 55''.7$ , and on the 16th it is N.  $13^{\circ} 43' 8''.9$ , the difference,  $25' 46''.8$ , is the variation in 24 hours; and the proportional part of this variation for 8<sup>h</sup> is  $8' 35''.6$ , which, subtracted from the declination at noon on the 15th, gives N.  $14^{\circ} 0' 20''.1$  for the Declination required.

*For the Meridian Passage.* Take the difference of the times of two consecutive transits; and considering this difference as an acceleration or retardation of the Meridian Passage while the planet has passed over 24<sup>h</sup> of geographical longitude, take the proportional part of it, due to the difference of meridians, for a correction to be applied to the Meridian Passage at Greenwich, bearing in mind that in east longitudes the passage precedes that at Greenwich, when times are accelerated, and follows it, when they are retarded; and the contrary in west longitude. In the present case Venus passes the meridian of Greenwich on July 15 at 2<sup>h</sup> 25<sup>m</sup>.7, and on July 16 at 2<sup>h</sup> 26<sup>m</sup>.3; the difference is 0<sup>m</sup>.6, therefore 24<sup>h</sup>: 0<sup>m</sup>.6:: 2<sup>h</sup>: 0<sup>m</sup>.1, the proportional part to be added to 2<sup>h</sup> 25<sup>m</sup>.7, (because the passages are accelerated, and the longitude is west of Greenwich,) which gives 2<sup>h</sup> 25<sup>m</sup>.8, mean time at the given place, for the Meridian Passage. Where great accuracy is not required, as in predicting the time of passage, in order to be prepared for observing the altitude of the planet on the meridian, for the determination of the latitude, this method will suffice.

Right Ascension and Declination at Transit over the Meridian at Greenwich, may be easily reduced to the time of transit over any other meridian not far distant, by means of their Variations in 1 hour of Longitude. Thus: prefix the sign — to the Longitude of the proposed meridian if it be east of Greenwich, but + if it be west, and multiply it by the variation; the product applied *algebraically* (South Declination being considered as negative) to the transit results for Greenwich, will give those for the proposed meridian. *Example:* Suppose the Right Ascension and Declination of Venus were required at Vienna on October 23rd, 1850. Vienna is east of Greenwich  $1^{\circ} 5' 31''.9$ , or —  $1^{\circ} 09'$ , and the "Variation of Right Ascension in 1 hour of Longitude" on October 23rd is +  $9''.24$ : the product of these numbers is —  $10''.09$ , which, applied to  $16^{\circ} 53' 53''.33$ , the Transit Right Ascension at Greenwich, gives  $16^{\circ} 53' 43''.24$  for that at Vienna. The Variation of the Declination on October 23rd is —  $19''.2$ , and the product of —  $19''.2$  and —  $1^{\circ} 09'$  is +  $0' 21''.0$ , which applied to S. or —  $27^{\circ} 3' 33''.4$ , gives S.  $27^{\circ} 3' 12''.4$  for the Declination at Vienna.

The "Sid. Time of Sem. pass. Mer." (Sidereal Time of the Semidiameter passing the Meridian,) serves to reduce an observation of the Right Ascension of the limb, to that of the centre, and the "Semidiameter" answers a similar purpose for the Declination.

The "Hor. Par.," or Horizontal Parallax, serves for reducing an observation made at the surface to the centre of the Earth.

---

(Fixed Stars. Pages 456 to 503.)

In pages 456 to 458 are given the mean Right Ascensions and Declinations of 100 principal fixed Stars for Jan. 1, 1850, together with their Annual Variations.

The *standard* Stars are distinguished by capital letters; North Declination by N., and South Declination by S.

The sign + prefixed to an Annual Variation of Right Ascension indicates that the variation is to be *added to*, and the sign —, that it is to be *subtracted from*, the Right Ascension: also, for Stars having North Declination, + signifies *add*, and — *subtract*: but for Stars of South Declination, + denotes that the Variation is to be *subtracted from*, and — that it is to be *added to*, the Declination.



*Example 1.* Required the Mean Right Ascension and Declination of  $\alpha$  TAURI or Aldebaran on May 31, 1850. The Annual Variation of the Right Ascension is  $+ 3^{\text{m}}.4331$ ; the Fraction of the year corresponding to May 31, is  $.411$  (page XXII. of May); the product of these numbers ( $1^{\text{m}}.411$ ) is the proportional part of the annual variation due to the period elapsed since January 1, which *added*, because the sign is  $+$ , to the Mean Right Ascension on Jan. 1, *viz.*,  $4^{\text{h}} 27^{\text{m}} 19^{\text{s}}.075$ , gives  $4^{\text{h}} 27^{\text{m}} 20^{\text{s}}.486$ , for the Mean Right Ascension on May 31. The Annual Variation of the Declination is  $+ 7^{\text{s}}.720$ , which, multiplied by  $.411$  as before, and the product ( $3^{\text{s}}.17$ ) *added*, because the sign is  $+$  and the Declination *North*, to the Mean Declination on Jan. 1, 1850, *viz.*, N.  $16^{\circ} 12' 11''.26$ , gives N.  $16^{\circ} 12' 14''.43$ , for the Mean Declination required.

*Example 2.* Required the Mean Right Ascension and Declination of  $\beta$  URSÆ MINORIS on June 1, 1850. Here the Annual Variation of Right Ascension is  $-0^{\text{m}}.2729$ , and the fraction of the Year  $.413$  (page XXII. of June); the product ( $0^{\text{m}}.113$ ) therefore being *subtracted*, because the sign of the Annual Variation is  $-$ , from  $14^{\text{h}} 51^{\text{m}} 12^{\text{s}}.063$ , the Right Ascension on Jan. 1, gives  $14^{\text{h}} 51^{\text{m}} 11^{\text{s}}.950$ , for the Right Ascension on June 1, 1850.

For the Declination, we have the Annual Variation  $= -14^{\text{s}}.759$ , which, multiplied by  $.413$ , gives  $6^{\text{s}}.10$ . The Declination being *North*, and the sign of the Variation  $-$ , this product must be *subtracted* from N.  $74^{\circ} 46' 6''.22$ , and the result is N.  $74^{\circ} 46' 0''.12$ .

*Example 3.* Required the Mean Declination of  $\alpha$  SCORPII or Antares on May 31, 1850. The Annual Variation is  $-8^{\text{s}}.464$ , and the fraction of the Year  $.411$ ; the product of these numbers ( $3^{\text{s}}.48$ ) being *added*, because the Declination is *South*, and the sign of the Variation  $-$ , to the Declination on Jan. 1, *viz.*, S.  $26^{\circ} 5' 38''.61$ , the sum, S.  $26^{\circ} 5' 42''.09$  is the Declination on May 31, 1850.

Next (page 459) follow Bessel's Formulæ of Reduction; and (pages 460 and 461) a Table for the Reduction of Stars, independently of the Astronomical Society's Constants, an example of which is given at page 608.

The apparent places of  $\alpha$  and  $\delta$  URSÆ MINORIS are given for every day of the year, and those of the remaining 98 Stars for every *tenth* day. They indicate the position which ought to be shown by perfect instruments at the time of the Star's transit over the meridian of Greenwich; and, therefore, supposing the catalogue of mean places to be correct, they serve to detect any errors of the instruments.

The hours and minutes of Right Ascension, and the degrees and minutes of Declination, are placed at the heads of the columns as constants, and belong equally to all the numbers below them. This arrangement has rendered it necessary, in numerous instances, to continue the seconds beyond 60, as the width of the page would not permit of otherwise indicating any change in the minutes. Thus, the apparent Right Ascension of  $\delta$  Canum Venaticorum at page 484, on December 17, 1850, is registered  $12^{\text{h}} 48^{\text{m}} 61^{\text{s}}.25$ , and is to be read  $12^{\text{h}} 49^{\text{m}} 1^{\text{s}}.25$ . Again, the Declination of  $\beta$  URSÆ MINORIS (page 487), on August 9, is registered N.  $74^{\circ} 45' 85''.4$ , which signifies N.  $74^{\circ} 46' 25''.4$ .

The small figures on the right hand of the vertical columns of seconds represent the differences of the quantities above and below them on the left, or the variation of Right Ascension and Declination in 10 days, and serve to find, by interpolation, the values for any intermediate day. As in the case of the Planets before explained, a Star will sometimes arrive at the meridian twice in one Mean Solar day. Wherever this occurs, an asterisk is placed opposite to the interval, and it signifies that the Star



has passed the meridian 11 times in the 10 Mean Solar days, and consequently that the Right Ascension or Declination on any intermediate day is to be determined in these particular instances by taking  $\frac{1}{11}$ th part, instead of  $\frac{1}{10}$ th, for the daily variation in the interval. Thus, at page 480, we find in the instance of  $\theta$  Ursæ Majoris, an asterisk opposite the interval between August 9 and 19, and a difference of  $0^{\circ}14$  opposite to the interval between the seconds belonging to those dates; we therefore infer that 11 transits have taken place, and that the daily variation of the Right Ascension is  $0^{\circ}013$ .

When extreme accuracy is required, the apparent places of the 5 Polar Stars demand a further correction, depending on the terms which involve  $2\epsilon$ . The apparent places do not include these corrections, on account of the rapid variation of the argument, viz., about  $26^{\circ}$  in a day, but they are given in a Table at pages 502, 503, for every degree of the Moon's Longitude, and may be readily applied, agreeably to the precept at the foot of that Table.

Formulae for correcting for *daily* aberration are given in the Preface.

*Moon-Culminating Stars.* (Pages 504 to 546.)

Those Stars are denominated Moon-Culminating Stars, which being near the Moon's parallel of Declination, and not differing much from her in Right Ascension, are proper to be observed with the Moon, in order to determine differences of meridians. This is effected by comparing the differences of the observed Right Ascensions of such a Star and the Moon's bright limb at any two meridians. If the Moon had no motion, the difference of her Right Ascension from that of the Star would be constant at all meridians; but in the interval of her transit over two different meridians, her Right Ascension will have varied, and the difference between the two compared differences will exhibit the amount of this variation, which added to the differences of the meridians shows the angle through which the westerly meridian must revolve before it comes up with the Moon; hence, and knowing the rate of her increase in Right Ascension, the difference of longitude may be easily obtained.

For the determination of this variation, recourse has hitherto been had to actual observations made at different meridians, because any errors in the computed places of the Moon and Stars are thereby avoided; and the places were formerly given merely with the view of indicating the times when the observations were to be made. In the present List, however, the Right Ascensions are given with every possible degree of accuracy, so that they may be considered, at least approximately, in the light of corresponding observations made at Greenwich, and be taken to represent the indications of the Greenwich instruments, the same as though they had been actually observed. The traveller has thus an opportunity of rendering his observations immediately available for determining his longitude with considerable accuracy.

The *Right Ascension of the Moon's bright limb* and *Declination of her centre*, at the instant of their respective transits at Greenwich, are given for the lower as well as the upper Culmination, *L.* being put to denote the Lower Culmination, and *U.* the Upper Culmination; the Roman numerals indicate the limb of the Moon with reference to its transit over the meridian. The Moon's age at the time of her upper transit, to the nearest tenth of a day, is inserted in the column containing the Magnitudes of the Stars.

The numbers in the column "*Var. of  $\epsilon$ 's R. A. in 1 hour of Long.*" represent the Variation in Right Ascension of the Moon's Limb during the interval of her transit over two meridians, equidistant from that of Greenwich, and *one* hour distant from



each other. They have been deduced from the Right Ascensions of the *bright limb*, and therefore include the effect produced by the change of the semidiameter.

They serve to determine the Longitude where the difference of meridians is not very great; but where this difference is considerable, and extreme accuracy is wanted, that variation in Right Ascension should be used which corresponds to the middle of the interval between the observations, which may be readily obtained by interpolation. They also serve to determine the Right Ascension of the bright limb at its transit over any other meridian. Thus: Multiply the difference of longitude between Greenwich and the given meridian, by the variation; and, according as the given meridian is east or west of Greenwich, subtract or add the product to the Right Ascension at Greenwich; the result will be the Right Ascension of the bright limb at transit over the proposed meridian. *Example:* On May 27, 1850, the Right Ascension of the Moon's second limb is  $17^{\text{h}} 59^{\text{m}} 41^{\text{s}}.75$ , at its upper transit at Greenwich, and the variation for 1 hour of longitude is  $132''.45$ : Required the Right Ascension of the limb at its upper transit at Paris. Paris is  $9^{\text{m}} 21^{\text{s}}.5$ , or  $0^{\text{h}} 156$ , East of Greenwich; therefore, multiplying  $132''.45$  by  $0.156$ , and subtracting the product  $20''.66$  from  $17^{\text{h}} 59^{\text{m}} 41^{\text{s}}.75$ , we have  $17^{\text{h}} 59^{\text{m}} 21^{\text{s}}.09$ , for the Right Ascension at Paris.

In a similar manner the Declination may be determined at transit over any other meridian not far distant from that of Greenwich, bearing in mind that South Declinations and East Longitudes are to be considered as *negative*. Thus, in the above *Example*: The Moon's Declination at her upper Transit at Greenwich is S.  $19^{\circ} 43' 59''.4$ , and the "Var. of  $\odot$ 's Dec. in 1 hour of Long." —  $115''.9$ , which, multiplied by —  $0^{\text{h}} 156$ , gives +  $0' 18''.1$ , to be applied to S. or —  $19^{\circ} 43' 59''.4$ ; the Declination at the upper transit at Paris is therefore S.  $19^{\circ} 43' 41''.3$ .

Where an asterisk is placed opposite to a Star's name, it is intended to denote that the Star is favourably situated for observing its Declination along with that of the Moon in both hemispheres, with a view to the accurate determination of the Moon's Parallax.

The numbers in the column entitled "Sid. Time of  $\odot$ 's Sem. pass. mer.," express the Sidereal intervals which the Moon's Semidiameter, at the time of transit at Greenwich, takes in passing the meridian, and therefore serve to determine the Transit of the centre from an observed Transit of either limb.

#### *Occultations.* (Pages 547 to 550.)

These pages contain a list of the Planets and Fixed Stars to the sixth magnitude inclusive, the Occultations of which by the Moon will happen when the objects are above the horizon of Greenwich, together with the Sidereal and Mean Times of the Immersions and Emersions, and the points on the circumference of the Moon's image, where the Star, viewed with a telescope that inverts, will disappear and reappear. By "Angle from N. Point" is to be understood the arc included between the Star, when in contact, and the point of intersection of the limb with a circle passing through the North Pole and the centre of the Moon's image; and by "Angle from Vertex," the arc between the Star at contact, and the point where a circle, passing through the zenith and the Moon's centre, intersects the limb; the angles in all cases being reckoned towards the right hand round the circumference of the Moon's image, as seen in an inverting telescope. These latter angles will be found very useful in observing Occultations of small stars with a telescope not mounted equatorially; and, for the observation of an Emersion, a knowledge of the angle is absolutely necessary to enable the observer to direct his attention to the point of the Moon's limb where the Star will reappear. In some instances, Occultations have been inserted which taking place in, or near



## EXPLANATION.

to, the horizon of Greenwich, are not visible there, but may be visible at places not far distant from Greenwich.

*Elements for facilitating the Computation of Occultations of certain Stars by the Moon.*

(Pages 551 to 564.)

These pages contain, 1. The *Apparent* places, at Greenwich Mean Midnight, of the Fixed Stars to the sixth magnitude inclusive, the occultations of which will take place above the horizon at Greenwich.

2. The *Apparent* Places of those Planets and *all* Stars to the fifth magnitude inclusive, the occultations of which will be visible at *some* part of the Earth.

3. The Greenwich Mean Time at which the Moon would, if viewed from the centre of the Earth, appear to have the same Right Ascension as the Star.

4. The difference of Declination and Position of the Moon, as it would appear with respect to the Star at the instant of Conjunction in Right Ascension.

5. The Parallels of Latitude *beyond* which the Star cannot be occulted by the Moon.

These Elements are useful in the calculation of an Occultation, for being referable to the Moon and Star, as seen from the centre of the Earth, they are independent of geographical position, and serve equally for all places. It is only necessary to apply the difference of longitude from Greenwich to the Greenwich Mean Time of conjunction, to find the time of conjunction at any other meridian; and it is this time to which the positions of the Moon and Star here given will equally correspond.

Thus, the position of the Moon and  $\nu$  Geminorum, on Oct. 25, 1850, at  $14^h 4^m 0^s$ , Mean Time at Greenwich, is the position at  $14^h 13^m 21^s.5$  Mean Time at Paris, because Paris is  $9^m 21^s.5$  east of Greenwich.

By Limiting Parallels are to be understood those parallels of latitude beyond which an occultation cannot *possibly* occur.

Suppose an observer situate at a star, and having the Moon between him and the Earth, and that he could see the Moon projected on the Earth's disc; he would observe it moving across the disc from west to east, covering a zone whose breadth would be equal to the apparent diameter of the Moon. Now, it is only within the limits of this zone that the Occultation of a Star by the Moon can take place. To all the places through which the boundary lines pass, the Star will appear just to touch the Moon's limb; and that projected parallel of latitude, to which one of the boundary lines is a tangent, is one of the limiting parallels, while the intersection of the other boundary line with the circumference of the Earth's disc determines the other limiting parallel.

Limiting Parallels are useful to indicate whether at a given conjunction of a Star with the Moon, the positions are likely to produce an occultation in a given latitude, and thus to save considerable labour to the computer.

Thus, suppose from the times of conjunction in the month of October, at page 561 it were required to prepare a list of Occultations for Greenwich, whose latitude is  $51^\circ 28' 38''$  N. On looking down the column of Limiting Parallels we reject at once the first star, because the Limiting Parallels do not comprise the parallel of Greenwich. On Oct. 8, we see that  $\gamma$  Libræ may be occulted to all the parallels of latitude between  $71^\circ$  N. and  $1^\circ$  S., which include that of Greenwich; this Star would therefore be fixed upon for calculation if no other considerations existed to cause its rejection. We observe, however, that the conjunction takes place at  $1^h 48^m 20^s$ , the intensity of sun-light would therefore prevent its being seen, and would be rejected in consequence. The next Limiting Parallels having Green-

## EXPLANATION.

between them, are 75 N. and 24 N., opposite  $\eta$  Libræ. The time of conjunction in this instance, as regards sun-light, is favourable; if, therefore, on further inquiry, the Star be found to be above the horizon of Greenwich, we should commence the calculation. It will appear on reference to page 549, that an occultation of this star is visible at Greenwich. On Oct. 23,  $\alpha$  Tauri may be occulted between the parallels of 90 N. and 35 N., but the phenomenon is invisible at Greenwich.

### *Phenomena.* (Pages 565 to 575.)

Pages 565 to 569 contain all the particulars necessary for indicating the times, places, &c., on the Earth where the Eclipses of the Sun will be visible; also the Elements which have been used in the calculations.

On pages 570 to 573 are given the conjunctions in Right Ascension of the Planets with the Moon, with each other, and with certain Stars; also the times when the Planets are in those parts of their orbits most favourable for observation, with a view to the more accurate determination of their elements; and other notices, chiefly of use to the astronomer.

### *Saturn's Ring.* (Page 574.)

On this page are given the quantities which enable us to determine the position of the Ring of Saturn at intervals of 40 days throughout the year, and whether it be visible or not. The value of  $p$  shows the position of the minor axis of the Ring with respect to a circle of declination, those of  $a, b, a', b'$ , the Ring's apparent magnitude, and a comparison of those of  $l$  and  $l'$  its visibility or otherwise. For the plane of the Ring to be *visible*, it is necessary that the Sun and the Earth should be elevated on the same side of it, which is the case during the whole of 1850. The circumstances which determine the *invisibility* of the Ring are, 1st, when its plane passes through the centre of the Sun, or  $l' = 0$ ; 2nd, when it passes through the centre of the Earth, or  $l = 0$ , and at this time  $b$  also  $= 0$ ; 3rd, when the Sun and Earth are on different sides of the plane of the Ring, for the Earth in this case will have the unilluminated side of the Ring turned towards it.

### *Phases.* (Page 575.)

This page contains two Tables, the first showing the *Mean Time of the greatest Libration of the Moon's Apparent Disc*; and the second, the *Illuminated portion of the Discs of Venus and Mars* at the middle of each month.

### *Tides.* (Pages 576 to 579.)

The Mean Time of High Water at London Bridge is here given for every day of the year, on the assumption that the time of high water on full and change days, or the *Establishment of the Port*, is 2<sup>h</sup> 7<sup>m</sup>. The first high tide which happens after Mean Noon of any day is inserted in the 1st column, and the second in the 2nd column. Where a line (—) is inserted, it indicates that there is only one high tide on that day. Thus on May 22 there is only one high tide: it occurs at 11<sup>h</sup> 54<sup>m</sup>, but the succeeding high tide does not take place until 20<sup>m</sup> after mean noon of May 23.

The times of high water at full and change of the Moon, as given at pages 578 and 579, are reckoned from *Apparent Noon*: They represent the *Establishments of the Ports*, that is, the *actual times of High Water when the Moon passes the meridian at the same time as the Sun*; or the *intervals between the times of Transit*



## EXPLANATION.

of the Moon and the times of High Water on full and change days. They serve to determine the time of high water on any other day at those places in the usual manner. The time of high water, however, at any of the places contained in this table, may be deduced for every day from the time of high water at London Bridge, by taking the difference between the *establishment of the port* at each of these places, and the *establishment of the port* at London Bridge, viz.,  $2^h 7^m$ , and considering this as a constant quantity, representing the difference of the tides between London Bridge and the place, to be *added* to, or *subtracted* from, London Bridge tides, according as the establishment of the port at the place is *later* or *earlier* than that at London Bridge. Thus the establishment of the port at Aberdeen Bar is  $1^h 11^m$ , and at London Bridge  $2^h 7^m$ ; the difference is  $0^h 56^m$ , and the Aberdeen tide precedes that at London: therefore, by *subtracting*  $0^h 56^m$  from the London Bridge tides, we obtain the Aberdeen tides in *mean* time. On February 27, 1850, the first high water at London Bridge occurs at  $2^h 57^m$ , which being diminished by  $0^h 56^m$  gives  $2^h 1^m$  for the corresponding tide at Aberdeen, and so for other places.

*Table showing the Correction required on account of Second Differences in finding the Greenwich Time corresponding to a reduced Lunar Distance. (Page 580.)*

The use of this Table has been sufficiently explained, by the Examples given at page 603.

*Tables for determining the Latitude by Observations of the Pole Star out of the Meridian. (Pages 581 to 583.)*

These Tables serve to determine the Latitude from an observation of the Altitude of the Pole Star out of the Meridian. The method of using them is as follows:

From the observed altitude, when corrected for the error of the instrument, refraction, and dip of the horizon, subtract  $1'$ .

Reduce the Mean Time of Observation at the place to the corresponding Sidereal Time, by the Table given at page 584. (See *Tables of Time Equivalents*, following this article.)

With the Sidereal Time found, take out the *first correction*, with its proper sign. If the sign be +, the correction must be *added* to the reduced altitude; but if it be —, it must be *subtracted*: in either case the result will give an Approximate Latitude.

With the Altitude and Sidereal Time of observation, take out the *second correction*, and with the day of the month and the same Sidereal time, take out the *third correction*. These two corrections *added* to the Approximate Latitude, will give the Latitude of the place.

*Example:* On March 6, 1850, in Longitude  $37^\circ$  W. at  $7^h 43^m 35^s$  Mean Time, suppose the altitude of the Pole Star, when corrected for the error of the instrument, refraction, and dip of the horizon, to be  $46^\circ 17' 28''$ : Required the latitude.

Mean Time	-	-	-	-	-	<sup>h</sup> 7	<sup>m</sup> 43	<sup>s</sup> 35
Diff. Long. ( $37^\circ$ ) in time	-	-	-	-	-	2	28	0
Greenwich Mean Time	-	-	-	-	-	10	11	35
Sidereal Time at Greenwich Mean Noon	-	-	-	-	-	22	55	27
Mean Time at Place	-	-	-	-	-	7	43	35
Acceleration (Tab. page 584) for $10^h 12^m$	-	-	-	-	-		1	4
Sidereal Time of Observation	-	-	-	-	-	6	40	

## EXPLANATION.

Corrected Altitude	- - - - -	46° 17' 28"
Subtract	- - - - -	1 0
Reduced Altitude	- - - - -	46 16 28
With Argument 6 <sup>h</sup> 46 <sup>m</sup> 48 <sup>s</sup> ,	First Correction	- 0 9 29
Approximate Latitude	- - - - -	46 6 49
Arguments, 46° 17' } 6 <sup>h</sup> 41 <sup>m</sup> }	Second Correction	+ 1 11
Arguments, March 6, 1880. } 6 <sup>h</sup> 41 <sup>m</sup> }	Third Correction	+ 1 20
Latitude of the place		- - N. 46 9 28

which differs only 2" from an actual trigonometrical computation.

The *Tables of Time Equivalents*, given at pages 584 to 587, are useful for converting Mean Time into Sidereal Time, and Sidereal into Mean Time, agreeably to the example annexed to each table. They will serve also for Tables of Acceleration and Retardation, by taking the difference between each argument and its equivalent. Thus, in the Table at pages 584 and 585, the *excess* of the sidereal time equivalents above the arguments of mean time show the *acceleration* of sidereal on mean solar intervals; and in the Table at pages 586 and 587, the *defect* of the mean time equivalents, as compared with the arguments of sidereal time, indicate the *retardation* of mean on sidereal intervals.

The concluding Table, at pages 588 to 592, contains the *Latitudes and Longitudes of the principal Observatories*. This Table has already been considerably improved, and will, it is hoped, be gradually perfected by communications from each astronomer, of the latest and most accurate determination of his geographical position.



